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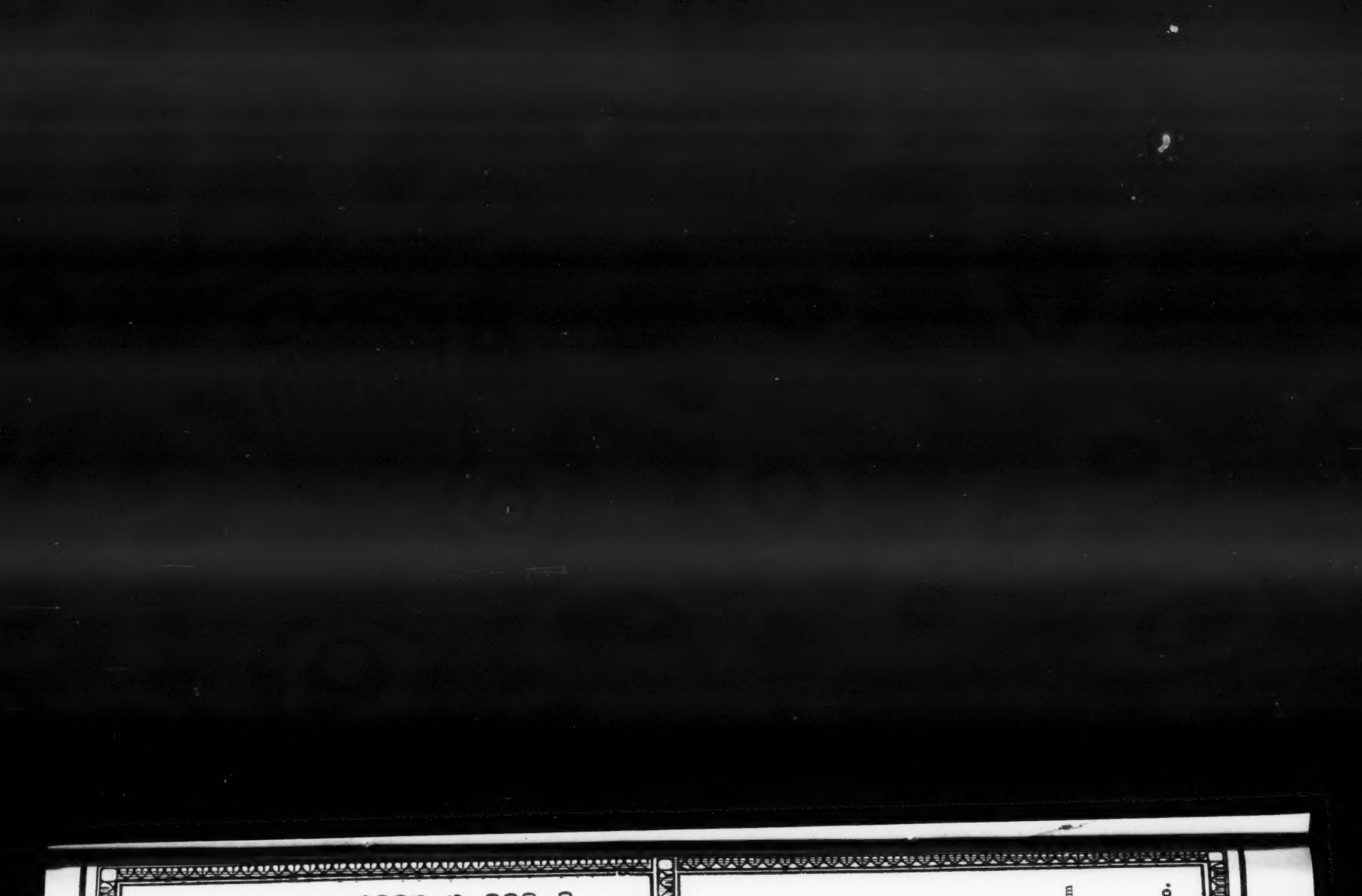

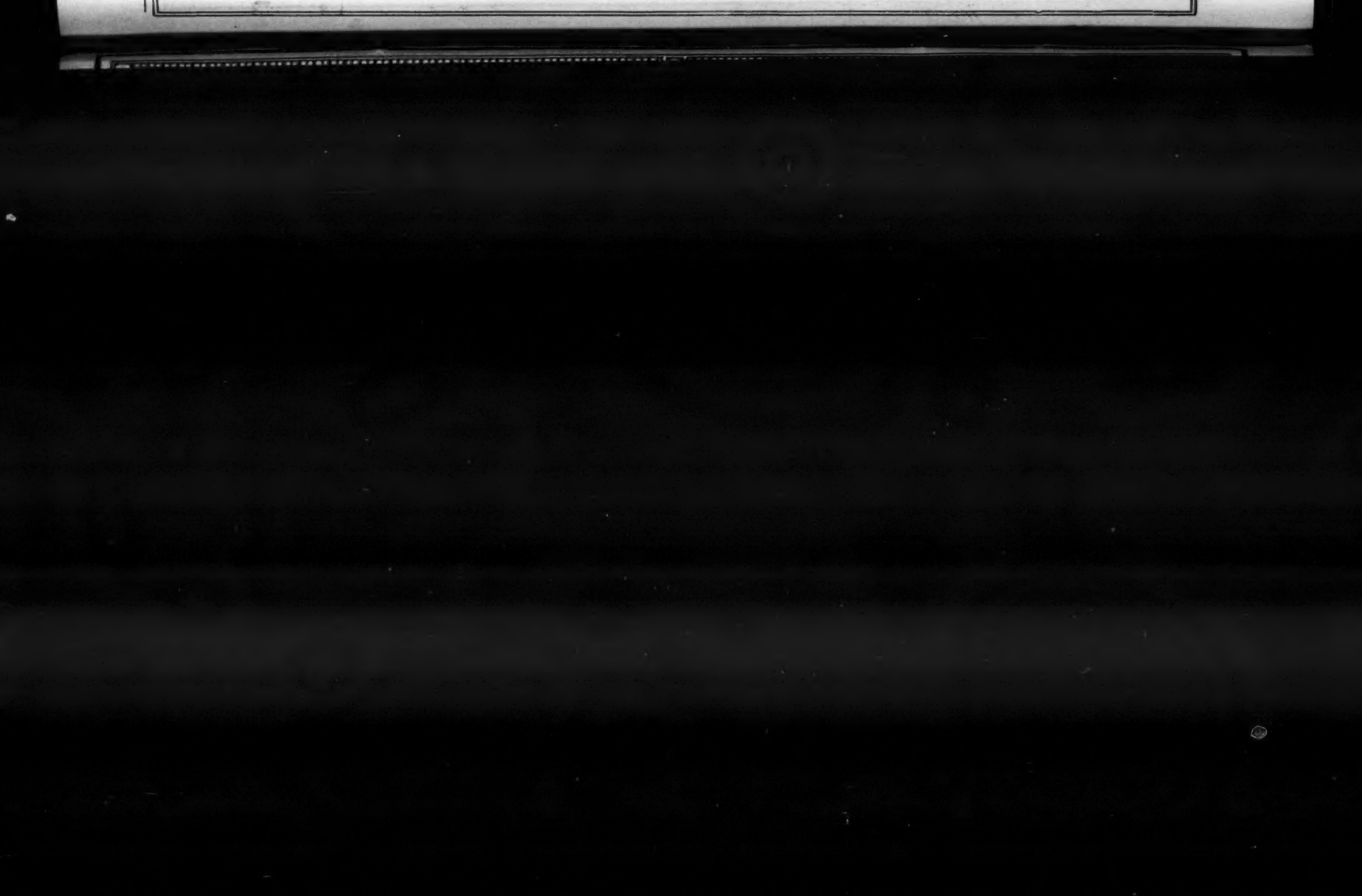

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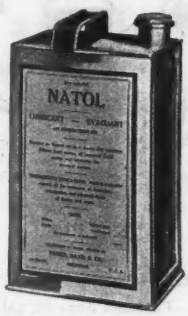

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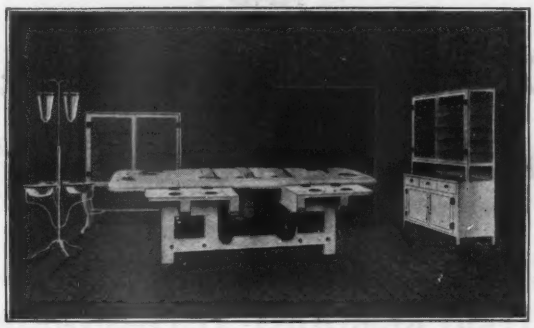

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VOL. XII DECEMBER, 1917 No. 12

Some of the More Common Diseases of the Heart*

By W. W. DIMOCK, D. V. M., Ames, Iowa.

THE basis of the material which I have to present is largely from the result of the examination of diseased hearts to be found in the museum of the Department of Pathology. Many of the specimens have been secured as a result of post mortem examinations conducted here at the college, but no small number have come to us from members of the profession in the state who have shipped tissues to the laboratory for purposes of diagnosis or as donations for museum specimens. I shall not attempt to cover the question of diseases of the heart as met with in our domestic animals in detail or in a systematic way, but I am going to take up some of the more important inflammatory conditions and pathological lesions as we have met them here and as they are found over the state.

Pericarditis

By pericarditis or inflammation of the pericardium we are to understand inflammation of the serous membrane lining the sac or pericardium proper, and that reflected over the heart, or both pericardial surfaces. Inflammatory processes may involve the entire surface being general or diffuse in extent, or be confined to limited areas giving rise to what we commonly speak of as a circumscribed form. The fundamental changes and resulting morbid processes are the same whether the disease is local or general.

The first evidence of inflammation in acute pericarditis is a congestion of the blood vessels in the membrane. This is followed by more or less desquamation of endothelial cells (mesothelial epithelium) and exudation, giving the membrane a cloudy, hazy, and lustreless appearance like the window lights in a room where steam is escaping or the same general appearance as a piece of glass described as having been "breathed upon." This is followed by a further loss of epithelial cells giving the pericardium a rough surface which gives rise to sounds sometimes heard during life. This condition is found in animals that die in the early stages of the disease; however, this form of pericarditis is usually accompanied by or is secondary to some other disease that is directly the cause of the death of the animal. This is the simplest form of the disease and it may terminate at this stage. However, if the process is continued, exudation occurs to some extent, and the character of the exudate becomes a distinguishing feature of the process. The exudate varies as experience has shown, from serous, fibrinous and purulent, to hemorrhagic or any combina-

*Presented at the Iowa Veterinary Association meeting, Ames, Iowa, Jan. 9, 1917.

tion of these forms. In the serous form, there is simply a large quantity of serous fluid pouring out from the inflamed surface into the sac. This fluid may be clear, or may contain fibrin.

In the hemorrhagic form, the fluid contains a large quantity of blood; that is, there is blood enough in the exudate so that it is recognized from the gross appearance, and from the gross appearance it may be diagnosed as a hemorrhagic exudate. I have seen some cases that, so far as one could tell from the gross appearance before examination with a microscope, were practically pure blood. In cases where the hemorrhagic exudate is of long standing, it has a brownish color, which is due to the breaking up of the hemoglobin.

In cases of dry or fibrinous pericarditis the exudate appears as a soft delicate thin membrane of a whitish or yellowish color and is very easily detached from the underlying surface. I have here a very beautiful specimen that shows the early stage of a fibrinous exudate. This heart was uniformly covered with the exudate in the form of a membrane so delicate that it has, in the process of fixation and handling, with the exception of a few places, practically all washed off. It was a most beautiful case of acute fibrinous pericarditis in a pig that died of pneumonia, the pericarditis being secondary.

I have a number of specimens that show this disease in larger animals, but the pig and sheep furnish us the best examples of this form where the condition becomes chronic. Great quantities of fibrinous exudate form in the cavity, become organized through the ingrowth of connective tissue and the two layers of the pericardial sac are often adherent, so there are great bands of fibrous tissue. Sometimes these are isolated bands, while in other cases for some reason the pericardium instead of being uniformly separated into the two layers seems to have been pushed to one side so that it is adherent over one-half of the area of the heart, and the other half represents the cavity in which will be found a considerable amount of the accumulated exudate, its character depending upon the nature of the inflammatory process.

In swine acute sero-fibrinous pericarditis is more or less common but is usually secondary to inflammation of the lungs and diseases of the thorax. The same is true of pericarditis in sheep. In cattle the acute form is, in my experience, only rarely met, but chronic suppurative pericarditis is rather common and especially the traumatic and tuberculous form. I have met with a number of cases of pericarditis in chickens; the acute form most often seen is associated with disease in other organs or in connection with infectious diseases, while the chronic fibrinous or

Probably one of the most common forms of pericarditis in cattle is what is known as traumatic pericarditis, the primary injury being the result of a metallic body passing through the reticulum and ultimately reaching the pericardium. As the metallic body, in the form of a nail, wire or needle, passes through (from the reticulum to the heart), there is more or less of an opening, depending upon the character of the body, carrying with it infectious microörganisms that set up inflammatory changes.

The foreign body is taken into the digestive tract accidentally with the food, or from chewing leather with buckles or nails in it, or cloth with needles, pins, etc. These sharp objects usually pass to the reticulum. Anatomically the reticulum, diaphragm and pericardium lie close together, and any sharp pointed metallic body can readily pass through the anterior wall of the reticulum, the diaphragm and then penetrate the pericardium and heart. Its passage is helped by the movement of the different stomachs, the diaphragm and lungs, and the suction movement of the heart itself. Small smooth bodies like needles may pass through without carrying infection and leave no visible tissue changes, others pass completely through, but as a result of their passage and of infection carried with them, there is established a reactive inflammation that ends in the development of a dense fibrous connective tissue band, attaching the reticulum to the

diaphragm and diaphragm to the pericardium. Often running through the center of this band is a fistulous tract kept open by the action of microörganisms or by the presence of the foreign body that because of its length or shape has failed to pass completely through. There are three conditions found upon post mortem examination that should determine whether or not a case of pericarditis is traumatic in its origin. First, the presence of the foreign body; second, the presence of a connective tissue band between the reticulum, diaphragm and pericardium; and third, the character of the lesions. In the majority of cases all three conditions will be found, in a few only two, and in one out of twelve cases, I found only the lesions, but because of their character this case was classified as being traumatic in origin.

The lesions occurring in traumatic pericarditis in cattle are in general the same in all cases, that is, there is a chronic inflammatory process with marked exudation and proliferation. The variations found are in the extent of the process, the character of the effusion and exudates, the reactive inflammation and the secondary and associated changes in the contiguous parts and of the body.

As soon as the foreign body penetrates the pericardium there is established an inflammation with marked exudation. The effused material is at first serous, later becoming cloudy due largely to the presence of leukocytes and fibrin and finally purulent when pyogenic microörganisms are present and continue to multiply. Often cases are found in which the pericardial sac is virtually an abscess filled with liquid pus; in other cases the liquid content is a cloudy serum of a reddish yellow color filled at the dependent portion of the sac with coagulated, stringy, fibropurulent material. In a few cases the fluid will be more or less colored from the presence of red blood cells or their pigment and in one case which was due to a darning needle puncturing the heart muscle, the effused material was purely hemorrhagic. With the accumulation of fluid in the sac, the pericardial membrane becomes distended and very thick. We have observed cases where the pericardium was three-eighths of an inch thick and the epicardium one-fourth of an inch thick, the latter being irregularly corrugated and covered with numerous pus pockets. The dense fibrous thickening of the pericardium, both parietal and visceral layers, materially delays or prevents systemic involvement and especially invasion of the heart muscle by microörganisms. In some cases the heart is adherent to the pericardium at points by means of fibrous bands or attached more or less completely over one side. In one case coming under our observation, an abscess had formed on the outer surface of the pericardium. Adhesions, fibrous thickenings, pus areas and fibrinous exudates are found on various parts of the pericardium. We have seen a few cases where the foreign body had penetrated the heart wall with laceration from the movement of the heart and considerable hemorrhage, but have never met with a case where the foreign body had passed through the heart wall to the endocardium. On the other hand we have seen a number of cases where the infecting microörganisms or their toxins had passed into the circulation and later involved the endocardium in inflammatory processes.

Associated with traumatic pericarditis is first an exudative pleurisy. The thoracic cavity contains a small or large amount of fluid which is serous, seropurulent or purulent in character. In all cases there is more or less fibrin formation either in the form of a false membrane on the pulmonary pleura, or masses of coagulated fibrin floating in the fluid, or on the costal pleura will be found a fibromembranous exudate, well organized and firmly attached to the underlying structures. The membranous exudate over the lungs is usually fibro-purulent in character and not firmly adherent. The fluid in the thoracic cavity presses materially on the lungs and heart, often displacing them and resulting in marked compression of the lungs. In some cases abscess formation has been found in the substance of the lung. There is enlargement and

discoloration of the mediastinal and other lymph glands, a sero-gelatinous infiltration of the mediastinum itself that often extends to the subcutaneous structures along the sternum and throat, which when present is a very suggestive symptom.

The liver is usually found to be enlarged, often to twice its normal size, and in our experience always shows degeneration, from simple cloudy swelling to fatty degeneration and focal necrosis.

The kidneys show various degrees and forms of degeneration. In some cases we have found only one kidney to be materially involved, it being twice its normal size and showing marked nephritis throughout. In other cases we have found both kidneys equally involved, showing inflammatory processes in their parenchymatous and interstitial structures. Amyloid degeneration is not uncommon. The kidneys when so affected have a light brown mottling, are rather firm and upon histological examination show that the degeneration started in the blood vessels of the glomeruli and extended to all parts of the organ, the tubules being filled with hyaline-amyloid casts. Changes in the kidneys usually result in disturbance of the other urinary organs which often becomes a marked symptom during the course of the disease.

A common symptom of chronic traumatic pericarditis is indigestion, constipation followed by diarrhea, rapid loss of condition, a lessening or complete cessation of lactation, failure to breed, or in pregnant animals death of the fetus and abortion. When such animals fail to respond to treatment one may well be suspicious of traumatic pericarditis. In acute cases the disease has been mistaken for pneumonia, poisoning and hemorrhagic septicemia.

Tuberculous Pericarditis

This is one form of pericarditis that I want to mention in particular. Tuberculosis of the pericardium or tuberculous pericarditis is due to the direct action of the tuberculous organism. The lesions resulting from the action of the organisms are in general the same as in other parts of the body. The process may be acute or chronic and the lesions may vary slightly in character, depending upon the extent of the infection and apparently upon the resistance of the host. The character of the exudate may be serous, purulent, fibrinous or it may in some cases be hemorrhagic. This is due largely to complications such as come from secondary infection. In the early stages where there is considerable exudate, it is difficult to distinguish between pericarditis of tuberculous origin and that resulting from non-specific forms of infection. The appearance of small amounts of fibrinous exudate, which occurs very extensively in some cases, is a rather characteristic early form. This is followed by the formation of large amounts of granulation tissue, the formation of tubercles, further exudation, and more or less necrosis in the organized exudate. Later the accumulated exudate on the surface of the epicardium becomes impregnated with lime salts and is calcareous in character. It may be in isolated areas only, but it is usually common throughout and forms a hard, dense, thick mass completely surrounding the heart. In such cases the pericardial sac is obliterated.

I dare say a good many of you have seen cases of tuberculous pericarditis, but I have here a specimen that was furnished me by Dr. A. L. Born, of Story City, Iowa, and it is one of the most extensive cases that I have ever seen. This heart came from a three-year-old heifer, and if I am not mistaken, the animal was one of many of an ordinary farm herd but she failed to breed. For that reason the farmer had fattened her and wishing to have for home consumption some meat that would be a little better than he could get on the market, the animal was killed. Upon opening the carcass at the time of slaughter a decidedly abnormal condition was found and he called in Dr. Born, who told him that from all appearance it was tuberculosis. Dr. Born secured the heart and sent it to me. The diagnosis was confirmed by finding the Bacillus tuberculosis in the exudate over the heart.

The wall of the heart itself as seen

from the cut surface is about three-fourths of an inch thick. The great mass of newly formed tissue and exudate is two-thirds of an inch thick. It is more or less necrotic, the necrosis showing well when it came in, but obscure now from the process of preservation. The large number of organisms present, and general condition of the lesion indicated that the condition was very active. The heart weighs 37 or 38 pounds; it was the largest I ever saw. I have seen a number of hearts from cattle with this form of disease, but they were simply encased with newly formed tissue in which considerable necrosis and calcification had taken place, the material that encased the heart being not more than an inch or so in diameter, but in this case the productive inflammatory process had gone beyond anything that I have ever seen, and was still active. It seems to me that when we find a heart like this from an animal apparently in the best of physical condition so far as a good cattle judge could determine, it ought to be sufficient to demonstrate to the satisfaction of all the necessity of detailed physical examination and tuberculin testing in the handling and control of tuberculosis in cattle.

Chronic Pericarditis

It should be remembered that the pathological changes encountered in cases of chronic pericarditis, are practically always the result of acute inflammatory conditions. Primarily acute pericarditis in the majority of cases will terminate in recovery or a chronic form of the disease. Cases of acute pericarditis that are secondary to other conditions, for example, pneumonia and systemic infection, more often terminate fatally. The most common form of chronic pericarditis is that in which there is an organization of the fibrinous exudate. This begins from the third to the sixth day, is conservative in character, tending to repair the injury that occurred during the acute inflammatory process. The fibrinous exudate is invaded from beneath by connective tissue cells, newly formed blood vessels and leukocytes, the exudate becoming incorporated and replaced by granulation tissue, and finally into fibrous cicatricial tissue which practically completes the organization of the exudate. According to the amount and extent of the exudate the fibrous thickening may be of the whole pericardium or small or large areas of sclerotic tissue.

If the exudate from the visceral and parietal layers of the pericardium are in contact, fibrous adhesions form binding the two layers together. These adhesions may be local, circumscribed, in the form of fibrous bands or more or less general, often completely obliterating the sac. An intermediate condition is that in which the motion of the heart has kept the opposing surfaces from uniting, producing "string like fibrous processes that hang loose in the pericardial sac." The above description applies in particular to the fibrinous and sero-fibrinous forms.

In the chronic purulent form of pericarditis the continued accumulation of the purulent exudate leads to marked distension of the sac. As purulent exudates are difficult of absorption the reparative process consists of a fibrous thickening of the pericardial membrane. This thick fibrous wall with the enclosed purulent material makes virtually an abscess. Partial recovery comes from inspissation of the pus followed by impregnation with lime salts. Such calcification may be in isolated areas or may form a complete investment of the heart.

Traumatic and tuberculous pericarditis of cattle are practically always chronic conditions. In traumatic pericarditis there is a marked thickening of the pericardium, the visceral layer having a rough corrugated appearance and the sac being markedly distended with purulent material. (See traumatic pericarditis of cattle.) In the tuberculous form there is little or no free exudate, but the heart itself is encased in a thick fibro-necrotic calcareous formation.

Secondary or associated conditions are hypertrophy and dilatation of the heart, degeneration of the heart muscle, hyperplasia of the connective tissue of the mediastinum or fibrous adhesions binding the heart to the pleurae, esoph-

agus and diaphragm. The above conditions are mentioned only in a general way as possible though rather infrequent changes. As no two cases give exactly the same pathological picture one should be careful to make detailed observations at time of post mortem.

Hemorrhages

In the diagnosis of a number of important diseases frequently occurring in domestic animals, hemorrhages of the

TRAUMATIC PERICARDITIS.

This illustration shows a cow's heart with a sixteen penny nail in it. This animal gradually lost in condition for four and one-half months. Dr. J. T. Traylor was called to see this case early in its course and pronounced it traumatic pericarditis "due to a sharp instrument penetrating the heart." This cow was found dead one morning and I was called, and on autopsy found this nail penetrating the heart; one and one-fourth inches of it was still in the pericardium. Note that the surface of the heart is in a sloughing condition. The pericardial sac contained about three gallons of yellowish, offensive fluid. It is supposed that the nail was ingested with cotton seed hulls.—Judge R. E. Richardson, D. V. M., Wichita Falls, Texas.

heart have come to be recognized as being of considerable significance. Small multiple hemorrhages beneath the epicardium are always suggestive of septicemia or general intoxication. In all cases of non-specific septicemias, hemorrhages on the heart are more or less frequently encountered. In hemorrhagic septicemia of cattle, in hemorrhagic septicemia or swine plague of pigs, chicken cholera and goose septicemia, hemorrhages of the heart are characteristic results and are, therefore, of great diagnostic value.

In cases of hog cholera where there is no gross evidence of a secondary infection, a few small hemorrhages may be found upon the auricles. The presence of hemorrhages on the ventricles of the heart in cases of cholera are to be looked upon, not as the direct result of the action of the hog cholera virus but as being due to the presence of microörganisms, either the Bacillus suisepticus or non-specific forms which represent a secondary infection. In hemorrhagic septicemia of cattle, the hemorrhages are most frequently found around the coronary region, extending down on the ventricles, or sometimes more or less numerous at the base of the large vessels. Hemorrhages may also be evident on the outside of the pericardium and surrounding connective tissue structures. In chicken cholera and goose septicemia the hemorrhages are more frequently over the thick muscular portions of the heart. When hemorrhages are present upon the heart of any of our domestic animals at the time of post mortem, one should remember that in a very great majority of the cases they represent a systemic condition, *i.e.*, a primary specific, or non-specific septicemia, or that they are the result of a secondary infection common to some of our specific infectious diseases or possibly to some organic disease, for example, pneumonia. Therefore, their use for diagnostic purposes in the gross depends upon a summary of the tissue changes found in the carcass as a whole. Experience leads me to feel that they are of great diagnostic value when one has come to understand and properly interpret the conditions under which they may occur.

Acute Endocarditis

The endocardium or lining membrane of the heart is continuous with the intima of the blood vessels. The valves of the heart are folds of the endocardium

and contain considerable fibrous tissue to give them strength. The mural endocardium consists of two layers, a thin fibrous portion (tunica propria) and an endothelial layer composed of flattened cells which are in contact with the blood. Inflammations of the endocardium vary from a simple more or less benign process to the more active forms often designated as malignant, the principal difference being the intensity of the process. The first evidence of inflammation of the endocardium is a cloudiness of the membrane. This cloudiness is believed in most cases to follow the action of microörganisms on the membrane, but it is also held that the microörganisms have been able to act only after the endocardium has suffered from some injury or lowered resistance.

Experimentally this is shown by injecting cultures of organisms into the circulation. Injuring the endocardium by passing a probe leads to lodgment of the organisms on the membrane, while in most cases where no injury exists no inflammatory process follows their injection. Following cloudiness of the membrane, there is considerable edematous thickening. The increased activity of the heart may produce further lacerations of the membrane, especially at points weakened from the action of microörganisms. In case the affected areas are not covered by a deposit of fibrin, considerable loss of substance may follow, especially in the more malignant forms. The deposit of fibrin results as a rule in the formation of warty masses on the surface of the membrane, particularly the valves, which are commonly spoken of as vegetations, vegetative or verrucous endocarditis.

These accumulated masses of exudate begin to undergo the process of organization or repair a short time following their formation. This is governed by the virulence of the infection. The organization is accomplished by the formation of granulation tissue. The young connective tissue cells grow up into the mass of exudate until they finally completely replace it. This newly formed fibrous mass finally becomes covered over with endothelium. In cases in which the growth is small and organization complete no material interference with the heart's action results, but in cases in which the accumulation of fibrin was large and irregular, organization may be complete, but the large irregular or warty growth materially interferes with the heart's action, especially when the valves are involved. (See description of chronic endocarditis.)

In those cases where the vegetation contains organisms of considerable virulence causing more or less softening or is otherwise of such character as to prevent or retard organization, portions of the growth may break loose and be carried to other parts of the body or organs by the blood stream and become lodged in the small vessels. Where these embolic plugs shut off the circulation of the parts infarcts are produced. If these plugs are of a non-infective nature the condition is not necessarily serious but emboli from the more malignant forms of the disease, may set up septic or suppurative processes in the part affected. In the simple form of acute endocarditis the effect upon the heart and the secondary changes are comparatively unimportant. In the malignant form, however, especially when there is ulceration of the endocardium or of the growths on the valves, it is far more serious. The direct interference with the action of the heart and the development of metastatic septic emboli in the spleen and kidneys and other organs of the body, become serious and it is to these that the disease owes its malignant character.

If any of you have made a study of the growths that occur on the valves of the heart in connection with many forms of systemic infection, you know that they occur at the point where the valves overlap when closed. In some of the early lesions we have been able to show that the membrane covering the valves is first injured at a point representing the margin when the valves are closed or at the margin where they overlap. This would seem to result from the fact that during infection of the system, there is increased activity of the heart, and the increased activity of the heart

increases the pressure at the time of closing of these valves, and naturally the point where the greatest strain comes is where the membrane would be injured. Other possible factors are that the organisms in the blood or on the uninjured membrane are caught between the flaps of the valve at the time of closure and pressed into the membrane, where they remain lodged, and finding nourishment develop and cause the resulting lesions. Another explanation is that the organisms causing vegetative endocarditis reach the valves in the general circulation and remain because the circulation of the valves is so slight that they are not readily carried away. Possibly they become lodged on the valve in different ways. In most of the growths that we have observed in pigs, horses and cattle, we have found microörganisms. They represent secondary infection in cases of specific diseases or a primary non-specific infection usually with pyogenic organisms.

I have here several specimens showing lesions of vegetative endocarditis that I wish to use to illustrate some of the more common forms. Not the heart shown on page 850. On the left auriculo-ventricular valve there may be observed a large mass of material. Anyone looking at the mass of organized exudate on those valves would see how there would be interference with the opening and closing. There would be some regurgitation, and because of this the heart has to work much harder, and the harder it works, the more aggravated the condition becomes.

One of the first cases to which my attention was called, some eight years ago, has an interesting history. This was in a large mare owned by a farmer near Ames. The mare had been running down in condition for some time and showed rather characteristic symptoms of swamp fever, although laboratory tests were not confirming. We kept the animal under observation for several weeks and finally she died. On post mortem the findings were very extensive lesions of suppurative nephritis. The heart had been removed and was placed on a table at the time of post mortem examination. It was apparently normal from external appearances and no particular attention was given to it. However, before we were through and without being careful to preserve the specimen, we cut into the heart and much to our surprise found several growths that had formed on the valves. The left and right auriculoventricular and aortic valves were involved, the aortic extensively. Nothing had occurred during the course of the animal's sickness to cause one to suspect there were any heart lesions of importance, nevertheless, we found these vegetative growths, that had occurred on the valves of the heart. In this case the exudate is pretty well organized and smooth on the surface. In case of recovery, it means that the infection is completely overcome or has become dormant, and the inflammatory exudate becomes hardened and held firmly in place by the new growth of connective tissue, so that the final lesion in case of recovery would be simply a fibrosis of the valve. It has always been a question as to which was primary, the vegetative endocarditis or suppurative nephritis?

Another case of considerable interest and one that we will remember for a long time was in a horse that had been treated for a bad tooth or infected sinuses, possibly both. The animal was apparently making an excellent recovery. The owner lived close by, and by telephone was advised to come in and get his horse. The clinic attendant had the horse out to water about one o'clock. Shortly the owner came into the clinic, paid his bill, and with the attendant went out to get his animal, which he found dead. A post mortem examination showed the local condition, the tooth and sinus lesion, to be healing perfectly satisfactorily. There was no evidence of infection at the point of operation. However, we found general evidence of systemic infection and a large vegetative growth on one of the valves of the heart, so large that it had almost completely shut off the passage of blood. The heart lesion and the systemic infection explained the sudden death of the animal.

One other case of interest that I wish to mention was in a shoat on the college

farm. At feeding time, this animal came up to the trough to eat. The feed was put in the trough, the pig took a mouthful or two and fell over dead. Upon post mortem examination we found extensive growths on the valves of the heart. The spleen was engorged with blood to six times its normal size and there was evidence of septicemia. This condition is met with very frequently in pigs as isolated cases and in a few instances in numbers to make one suspicious of a specific infectious disease. Such cases have been known to follow vaccination for hog cholera and are apparently the result of lowered systemic resistance permitting some secondary infection to the extent that the organisms become general in the circulation. Vegetative growths form on the heart and pyogenic organisms are found in the exudate. Septic emboli are extensively distributed in the spleen and other parts of the body and all the parenchymatous organs are in an advanced stage of granular degeneration.

Chronic Endocarditis

Chronic inflammatory changes in the endocardium most frequently follow the acute form, but in rare cases are chronic from the beginning. They are both characterized by a fibrosis of the endocardium.

Following acute inflammations of the endocardium there are very frequently found taking place proliferative processes which are characterized by those tissue changes associated with the organization of exudate through the ingrowth of connective tissue and blood vessels. For example, the exudate or vegetations on the valves of the heart become firmly organized until they ultimately represent thickening of fibrous tissue covered over with a normal endothelium. While this is in general a healing of the lesion, it often leaves the valves thick, stiff and deformed, resulting in interference with the function of the valves, preventing their opening properly, or a narrowing of the orifice (stenosis). At the same time proper closing of the valves is impossible. This allows the blood to pass in the wrong direction (regurgitation). In an attempt to overcome this interference of the passage of the blood through the heart, there is first a hypertrophy followed in the majority of cases by dilatation. Our experience would indicate that dilatation of the heart which has been brought about by an attempt to overcome some interference with the circulation is most frequently observed in dogs and horses and is rather common.

The endocardium lining the cavities of the heart may show chronic inflammation in the form of fibrous thickenings, in cases of dilatation, in cases of chronic interstitial myocarditis and rarely as a part of a general chronic inflammation of the arteries as is seen in cases of sclerosis.

In those cases where portions of the exudate, dead organisms or necrotic tissue have not become incorporated in the organization or failed to have been removed by absorption, lime salts may infiltrate the area and bring about small or large areas of calcification.

Suppurative or ulcerative lesions are often found on the mural endocardium and while they cannot be classed as chronic, their nature and extent lead one to assume that they have certainly passed the primary acute state. Possibly they should be considered as subacute.

Myocarditis

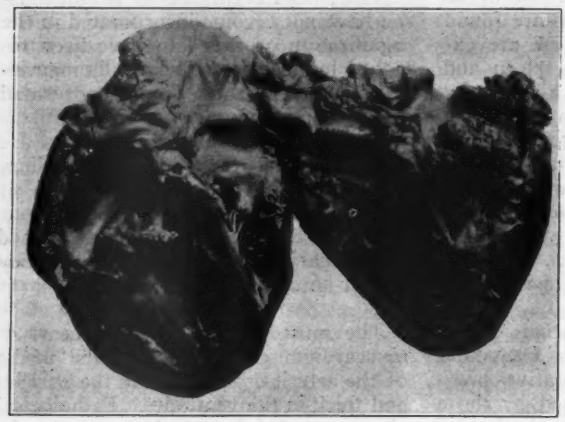
The muscular layer of the heart or myocardium corresponds to the media of the arteries. It is thin in the auricles and thick in the ventricles. Pathological changes more frequently occur in the walls of the ventricles, due no doubt to the work performed by these parts. The myocardium has a rich supply of capillary blood vessels from the coronary arteries, many of them end arteries.

Acute myocarditis may be parenchymatous or interstitial. Acute inflammations of the myocardium are usually toxic or infectious in origin. In some cases the only change is degeneration of the muscle fibers, cloudy swelling and fatty degeneration, in which case the myocardium appears pale, soft and is easily torn. Sections of such tissue under the microscope show the muscle fiber to be swollen, more or less granular and the striations obscure. The fragile condition of the fibers resulting from de-

generation often results in fragmentation or segmentation. Acute myocarditis resulting from direct invasion of microörganisms or from infected emboli of the coronary arteries results in changes depending upon the character of the microörganism. Pus cocci produce necrosis or abscess formation which may be either local or general. In case infarcts are formed coagulation necrosis of the tissue involved results. This may become progressive in character and finally destroy the heart muscle and cause death. In some cases microscopic preparations show considerable hemorrhage.

The lesion from pyogenic organisms usually takes on the form of an abscess. Diffuse suppurative processes may so weaken the heart as to lead to rupture and hemorrhage into the pericardial sac, frequently resulting in more or less sudden death. Rupture into the circulation may result in general pyemia or septic embolism. The development of thick walled abscesses in the heart may take place especially in cattle. They represent the repair or attempted repair of acute suppurative lesions. The affected area may be completely replaced by connective tissue, become calcified or remain as an abscess until the death of the animal. Such abscesses often have a tendency to develop toward the endocardium or epicardium on which will be found over the affected area more or less organized fibrinous exudate. I have a few specimens from apparently healthy animals where death occurred suddenly upon rupture of the abscess.

I wish to call your attention to one specimen showing a large local abscess in the wall of the left ventricle of the heart. This was in a dairy cow and the specimen was furnished me by Dr. Sperry of Fayette, Iowa. The animal was apparently in perfect health and suddenly dropped dead. Upon post mortem the heart was found to show a large thick walled abscess, the epicardium over the abscess being bulged and showing considerable organized fibrinous exudate. I understand the post mortem was not complete as the operation was performed by the owner and only the heart and a few parts were taken to Dr. Sperry. As the lesion is rather extensive, it is very possible that organisms and toxic products from it were finding their way into the circulation so that septicemia or toxemia was the direct cause of death.



Pig's heart showing vegetative endocarditis on the left atrio-ventricular valves.

Acute interstitial myocarditis is principally encountered in the form of abscess formation, which follows in general the same course as abscess formations in the myocardium proper and as a simple interstitial inflammation without evidence of suppuration. In the latter the lesion consists principally of an inflammatory condition starting in the interstitial structures. It may terminate in a mild fibrosis or may in rare cases involve the muscular portion. In the early stages there is frequently considerable lymphoid or round cell infiltration.

Round cell infiltration in the interstitial structures of the heart in cases of leukemia (cattle and swine) and round cell sarcoma (horse and sheep) should not be mistaken for inflammatory lesions. In chickens I have frequently found in both gross and microscopic specimens various degrees of round cell

infiltration but the observations have not been carried far enough to permit making a final differentiation. In hearts from chickens we frequently find grayish or yellowish points through the myocardium. Upon section they are found to be areas of round cell infiltration. There is often more or less pericarditis. It is no doubt a lesion of fowl typhoid. Organisms isolated morphologically correspond to the Bacterium sanguinarium.

Secondary Conditions

Unfortunately there is not time to discuss conditions secondary to or associated with the various diseases of the heart; neither would it be possible for me to do so without notes except in a general way. However, I wish to speak of a few conditions that to me seem to be worthy of our consideration and a second thought. I have already referred to amyloid degeneration of the kidney in cases of traumatic pericarditis, also chronic suppurative nephritis as being associated with vegetative endocarditis. In diseases of the heart, such as stenosis and regurgitation or in dilatation there are often associated congestion and degeneration of the liver, dropsy and circulatory disturbances that may affect different parts and organs of the body and shown principally in the form of a chronic passive congestion and edema. Dilatation of the heart may result from any disease that causes increased activity to keep up a normal movement of the blood. It also results from long continued or violent exercise (overwork) and is most frequently seen in old horses that have had a life of hard and fast work and in hunting dogs. In dogs ascites is a very common secondary condition.

To more completely harmonize our knowledge on diseases of the heart, as met with in our domestic animals, we need to have more accurate data on the history, clinical symptoms and morbid anatomy of a large number of cases.

During the course of any of the inflammatory conditions met with in the various structures of the heart, pericardium, myocardium or endocardium, it is to be remembered that where the disease is primary in one it is very often secondary in the other. For example, in cases of myocarditis, the epicardium or endocardium, or both, may sooner or later become involved. Again in cases of infectious pericarditis, endocarditis may develop. Not infrequently the inflammatory changes have so diffused from one point to another as to make it difficult to determine the primary location.

Discussion

Dr. S. Stewart: I feel highly edified that I had the privilege of hearing the paper by Doctor Dimock. He brought out things that are positively helpful if we are students of the subject at all. There are one or two features that struck me and that come home to one holding an autopsy, and that is the difficulty of passing with any degree of satisfaction on the cause of death. In the paper Doctor Dimock did make allusion to the fact that where the vegetative growth was in the case of the horse, it obstructed the channel, and if I get that correctly, the vegetation was on the auriculoventricular valve. The movement of such vegetation is ordinarily into the ventricle; also it is a matter of very gradual evolution; and if there has been a gradual obstruction over the ventricle, the heart is compensated for that, first, by hypertrophy, and then, by dilation. I am wondering how he can arrive at the conclusion, in the case where there was an abscess in the wall of the heart, that the abscess should be credited with causing death. The compensation of the heart is very considerable. Of course, there are vegetative growths that may become detached and go through the circulation and get to the brain and cause death, but I do not see how the attachments on the heart itself cause death.

Doctor Dimock: There is a phase of pathology that has not been thoroughly worked out. It receives very little attention probably from most of us, and that is what we know as clinical pathology. The material that I get for examination is practically always from animals that are dead, and the animals I get for examination are usually dead. I have not made a study of animals during their life and then had the opportunity, except in a very few cases, to hold a post mortem examination. There is another thing or two that might be said regarding the cause of death in some of these cases. First, this idea that the heart rapidly undergoes hypertrophy, compensatory hypertrophy, is a condition that has been relegated to the history of pathology and not as a process. We do get now and then typical

cases of dilatation, but they do not occur with the lesions about which I have spoken. These cases of vegetative endocarditis are practically the result of Staphylococcus aureus and albus, principally these two. There are sometimes, of course, others that belong with the pathogenic organisms. These are active processes, and they come out rather suddenly in most cases. It is true that most of the growths are on the auriculoventricular valve, but the size of these growths is such that no amount of valvular tissue can make up for the space they occupy, and they must interfere with the opening of these valves. Most of them are on the side of the auricle. The valve cannot contract but is held there stiffly by this thick, fibrinous exudate, and it seems to me that it is only logical to assume that it has a very immediate and material effect on the movement of the heart and the passage of the blood. If the ventricle attempts to close and the blood is forced out of the channel where it ought to go, there will be some general systemic disturbance, and then too we have on top of this the fact that the pathogenic organism occurs throughout the circulation, so there is in connection with that a general septicemia, and the combination of the two will in cases be enough to kill these animals. Some of them live for sometime and others die suddenly. If the lesions on the valves of the heart plus the septicemia were not the cause of death, and if that does not explain it, I don't know what would.

Dr. E. L. Quitman: I should like to ask Doctor Dimock if he has made an examination of the hearts of heavy horses that have suddenly dropped dead, and I should like to ask Doctor Stewart why he does not accept the logic of his own convictions that death can occur. We have seen some of this where it seems that the mechanical condition there would wear out the heart. Taking a "heavey" horse, we know that, when that horse reaches an age of 14, 15 or 16 years and he has had heaves a number of years and he gets to a stage where the driver reports the horse has to stop on the street to get his breath, we can prophesy that the horse will drop inside of six months, particularly in warm weather, but not necessarily. In hot weather, however, it is almost certain that six months will be his limit. It is not the heaves that will kill that horse—it is the hypertrophied heart that will kill him. Why should hypertrophy of the heart kill that quickly? You will find no lesion there.

Doctor Stewart: I want again to repeat that mechanically I cannot see any good reason why the patient should die at all. I can evolve a theory that will pass with the owner when it is necessary, but in many cases it is not quite clear why the animal should die. It is a question I have put to undergraduates, as to why a patient dies. They have theories. The theory of Doctor Quitman that there is a sudden paralysis of the heart is as good as any, but why there is a paralysis is a conundrum. It has been moving along, and we see no reason why it should not continue.

Dr. Burton R. Rogers: I should like to know if Doctor Dimock would give us a statement of his opinion of the antemortem and postmortem clots? I would call them "so-called."

Doctor Dimock: I understand that antemortem clots most frequently occur in those animals that are in general very weak from some systemic trouble, and when the animal is, as you might say, dying, the elements of the blood coagulate in this way as you have seen them, that is, the white blood corpuscles and the serum separate out. For instance, in horses that die from silage poisoning where they are down for some time and death is slow, we know for a number of days that the animal is going to die. The temperature is subnormal, the pulse weak, and the heart's action and the general circulatory movement are such that the blood seems to separate out. Then there is in addition to that certain chemical changes going on in the blood that tend to favor this in particular diseases. We do not know as much chemical pathology as we ought to know. Some of these things that we look upon as being due to general conditions may have some really fundamental reason that we have not yet thought about, and I look for many of these problems to be solved when we have a more definite knowledge of the chemistry of the various fluids and tissues in the body. The blood clots have nothing to do with the cause of death but are the result of the way the animal dies.

Doctor Quitman: Doctor Rogers seems to ridicule the idea of antemortem clots. We bump up against that with quite a bit of frequency in influenza. In fact, I hardly believe there is any other disease in which this antemortem clot occurs as frequently as in influenza, and I do not know of anything that is quite as disappointing as to have a run of influenza in a stable, horses getting over it nicely, but here is a certain fellow that reaches a certain stage and he stops, the temperature goes down to normal or perhaps varies from normal a couple of degrees, and he gradually loses flesh. You can find no pathological condition there to lay your hand on and say why he doesn't get well. You realize that animal is dying, but he may live two or three weeks. That animal has recovered from the influenza, but as a result of the influenza, a blood clot has formed, and finally it gets to be a mechan-

ical obstruction of the heart. Perhaps the animal will live long enough to show some typical condition or edema of the legs. I should say that the antemortem clot killed that horse. That is only one picture of a case of that kind I have had in a number of years. After a while your experience gets so that you can say to the owner that the horse has heart failure due to this antemortem clot. You, of course, predict the time of his demise according to the age of the horse and how long he has had the clot. I have seen these animals dying, you might say, for two or three weeks, and in one case, considerably longer than that. It was over the influenza, but it was the antemortem clot that prevented recovery, just as from any infection endocarditis may result. The infection may be overcome easily but the endocarditis gets worse and worse.

Dr. Stewart: I want to confirm what Doctor Quitman said and that I believe antemortem clots do form and obstruct the channels of the heart. I believe that an astute diagnostician can determine at least two or three days, oftentimes longer, before the death of the animal that such a clot is forming and that the ultimate outcome will be death. I have in mind at this moment a case of a horse that I thought was a case of colic, which was treated, and the horse lived five days. I was satisfied at the end of the second day that the case would not recover, and he died. The autopsy was held immediately, and we found a fibrous clot with projections out into the bronchial vessels and the veins of the heart, and when the mass was removed it projected into the right ventricle. The mass consisted of fine fibers, and I could see that that obstruction killed the horse. So I think there are some genuine antemortem clots.

Experiments in the Differentiation of Blood and Muscular Albumin by Precipitation and Anaphylaxis

By CAYETANO LOPEZ, Barcelona, Spain, Inspector Provincial de Higiene y Sanidad Pecuarias.

WHEN observing what happens in the tissues of individuals during the process of immunization, one will be surprised to note that the organisms produce ferments under the excitement of the antigen. These ferments are exactly adapted to the particular digestion which is to take place and they perturb the homogeneity of the internal medium as though an occult intelligence presided over these functions. If the substance inoculated is amorphous (in dissolution) the tissues respond by producing precipitins which reunite it. If organized bodies (as blood cells, microbes, etc.) are inoculated, cytolysins, bacteriolysins, etc., are produced.

But everything indicates that the production of these ferments like that which occurs in the digestive apparatus with the ferments of digestion constitutes only the first part of the immunity, not all of it, as the real immunity like the real general nutrition of the cells will come afterwards. The process, therefore, is composed of a preparatory phase, digestion, and a final stage, nutrition.

One of the preparative ferments (digestive) is found in the precipitins, which Krauss, Bordet and Tohistowitch were the first to investigate, and the principal practical application of which we find in the differentiation of serum and muscular albumin.

In spite of the large amount of time and work that has been dedicated to the study of this question, much still remains to be found out, and here in Spain, for example, nothing practical has been done, to the evident satisfaction of the business people. When I commenced my experiments, I asked myself if the fault of this did not lie in the difficulties met with in the preparation of the precipitant serums, and my principal object, when I began working, was to try and discover new methods of precipitation.

To obtain serums for the differentiation of the albumin of blood serums, the three processes most employed are:

1. The principal, which consists in practising four or more intravenous in-

oculations of blood (quantity 1 c. c.), the injections being made every five or six days.

2. Five or six subcutaneous inoculations of blood (the corpuscles alone would not give precipitins), consisting of from 6 to 10 c. c. are made, with an interval of six or seven days between each inoculation.

3. That of Fornet and Müller, or intensive, which consists of three intraperitoneal injections made on three consecutive days of serum or blood in quantities of 5, 10 and 15 c. c.

But are these processes really practical? Can serums of great strength be obtained by employing them? Are the serums obtained, sufficiently specific,

The inconveniences of the first two and best known methods are the length of time required, as four weeks are required to obtain a serum, not always of great value, and in the first, the anaphylactic accidents which may present themselves after the second inoculation, if the latter are not done with care.

With the intensive method, three intraperitoneal inoculations of 5, 10 and 15 c. c. of serum or blood three consecutive days abbreviate the time. Moreover, the production of precipitins is perhaps less, it having been proved that there is more localization of the reaction.

My experiments have demonstrated the possibility of obtaining serums of extraordinary value, as they frequently exceed one per hundred thousand, employing blood serum or plasm in maximum doses, making inoculations at intervals of only twenty-four hours.

For example, rabbits weighing three kilos supported well an intravenous injection of 20 c.c. horse serum or plasm, a second and a third injection of the same quantity, the second and third days, it being possible after twelve days to make a new inoculation of such great strength as the aforementioned, always provided that one standardizes against the homologous horse serum. Following this method, not only is much precious time saved, but the anaphylactic accidents are avoided.

As the experiments effected authorize me to affirm that this method is better than any other for obtaining serums of great value, a great advance has been made in the definitive solution of the problem.

One point which should be emphasized is that relating to the specificity; besides I can categorically affirm that serums obtained by this process are quantitatively specific, which is essential. It shoull not be forgotten that natural precipitins exist, which show a common origin and quantity of precipitogen.

The problem of obtaining with rapidity, a specific and precipitative serum being resolved, I, as a veterinarian, was more interested to know if this serum could be used for the differentiation of meat, and employing meat juice and macerated meat, I found them to be precipitants, but of too weak a degree; therefore, I proceeded to investigate along other lines

Differentiation of Muscular Albumen

I shall give a brief account of the antigens employed in obtaining serums for these purposes before speaking of my own experiments, and the knowledge to be obtained from both.

Bordet, Thistowitch and Noll indicated that the serum and plasm, without the necessity of special preparation, constituted the fundamental element. Nbiessner, Herbst, Kister and Wolff, Vallee and Nicolas preconized the use of blood serum heated to 55° as a precipitogen. The two first, afterwards resorted to meats finely minced and soaked in physiological salt solution. Westel treated the meat with an alkali for three hours, in the proportion of one part meat to two parts of a one per cent. sodium hydroxide solution; the whole is pressed and afterwards injected.

Pierkowski considers it preferable to employ the albuminoid substance of the meat, treated by Blumenthal's method, which consists in mincing 500 grams of meat, boiling this in one liter of water for 30 minutes at a temperature of 40°, extracting the liquid by compression, filtering the liquid and adding a 5 per cent. soda solution, also acetic acid, and precipitating with alcohol.

Ruppin advises the injection of muscular juice extracted with an aseptic press, Vilein's system, basing his opinion on the

great value of the muscle precipitins as creators of the precipitins of meats.

Groning recommends that one pound of fresh meat be submitted to congealation and decongealation and once the liquid is collected aseptically, the necessary injections should not be made until the function of precipitation occurs.

Petrini modifies these proceedings in the following manner: A quantity of meat is minced and then pounded in a mortar until it acquires the consistency of paste. It is then filtered and a 5 per cent. solution of phenol added to the filtered liquid. The extract thus obtained is put into sterilized mattresses.

Schmidt made rabbits immune with serum coagulated by heat, dissolved at once by the action of an alkali. The precipitins thus obtained would give precipitates with the serum, the albumin of which has been coagulated by heat and then at once dissolved by the action of an alkali.

Vila used the plasm. He collected, in green glass bottles, sterilized and covered with protecting paper, and containing a 50 c. c. anti-coagulating solution of 20 grams crystallized sulphate of magnesia per liter (Dr. Guessard), 900 c.c. of horse blood, which after a short repose was centrifuged and the limpid plasm collected.

He inoculated strong rabbits every four days into the marginal vein, with 5 c.c. of plasm in each injection. At the fourth inoculation, and in order to avoid anaphylactic accidents, he injected into the vein only 2 c.c., but at the same time practicing an inoculation of from 1 to 2 c.c. under the skin of the ear. After eight inoculations the rabbit is bled.

From the experiments made, on the basis of these antigens, the impression is obtained that they treat of a technic complicated and useless, and showing results hardly acceptable.

Chaplher more reasonably recommends the obtaining of special precipitins that may act on albumin heated, and on albumin denaturalized by alkalies.

He denaturalizes in the following manner: to the serum add an equal amount of physiological serum, heat during 30 minutes at 70°, adding at once a normal salt solution in the proportion of 1:12 and heat again at the same temperature.

His first conclusions are, that it acts firstly, on its own antigen; secondly, on the serum heated to 100°; thirdly, on the serum heated to 100° with a relatively weak alkali; fourthly, on extracts of meat and of different organs. But, seeing that there was not sufficient specificity he made new investigations and prepared the following three extracts: 1. Meat extracts obtained by the maceration of minced meat with a physiological serum. 2. Meat extracts prepared by the maceration of minced meat with physiological serum adding, either from 0.1 per cent. of carbonate of soda or a 0.1 per cent. solution of soda. 3. Juice from pressed meat. His conclusions are that the latter are preferable for muscular albumin.

Thus, having compared serum obtained by injecting serum and plasm, with that derived from macerates and meat juices, I found that the latter, although precipitate and specific, was too weak. As to juices obtained by pressing, only small quantities could be obtained, and they possessed very toxic properties, even after having been in chloroform for days.

The first problem to be solved was the finding of a practical method for obtaining an abundance of meat juice which would keep without alteration, and after several trials, I discovered such a method.

A large quantity of juice can be obtained within a few hours from minced lean meat, to which is added sodium chlorid. For example, one-third of the weight of the meat. This juice as also the meat, can be preserved without an addition of any other substance.

Juice obtained in this way is dialyzed through parchment paper before using, and with eight hours washing in running water, loses nearly all the salt.

This antigen has not yet been employed on a sufficient number of rabbits, and in large quantities, but, nevertheless it is possible by intravenous and intraperitoneal injections of from 2 to 5 c.c. to obtain, after five or six inoculations made at intervals of from five to six days, a serum of sufficient value, although inferior to that obtained through the intensive method of serum or plasm.

The standardization of serums ob

tained by injecting meat juices obtained by pressure, and of those obtained by salt, is always done by employing macerates of meat in physiologic serum and juices which contain from five to seven times less albumin than blood serum.

My conclusions drawn from the first part of the as yet unfinished work, are the following:

1. To obtain precipitating serums for blood albumin, the best method is that of intravenous injections of 20 c.c. each, three consecutive days, rabbits to weigh at least three kilos.

2. The precipitating serum obtained with this technic are of a much greater value than those got by other methods.

3. They are specific quantitatively, precipitate, although in much less proportion than the macerates and juices of meat.

4. For the differentiation of albumin of the muscles, the best and most easily obtained and preserved antigen, is that obtained by adding sodium chlorid to the minced heat; juices obtained by pressing come second, and plasm and blood serum in the intensive method take the third place. The juices have only been tried by the slow method.

5. The precipitated serums thus obtained are of great value, and are specific, quantitatively, as it must not be forgotten that natural precipitins are present, which show a common origin, and quantity of precipitogen, even though the precipitate is formed at the expense of the serum it precipitates.

Anaphylaxis

If, in general, precipitation can be used for the differentitation of albumin, there are occasions when a greatly accentuated degree of specificity is required. For example, when dealing with denaturalized albumin, in which case there is a group precipitation, which the precipitins do not cause, because the meats denaturalized by heat would not give precipitins (Besredka). On the other hand, it is already known that in anaphylaxis there is a greatly accentuated specificity, which gives reaction with heated albumin, and that the minutest quantity, even a millionth part, is sufficient to sensitize the guinea pig.

For these reasons, I decided to experiment in anaphylaxis, a work initiated in 1910 by Uhlenburth, Händel and Bauer. These investigators said that even if in the majority of cases the process of differentiation of albumin by precipitins was sufficient, and of the same value as anaphylaxis, this latter is in some cases superior, as for example, in wounded meat. They are able to determine the nature of mummies thousands of years old, and to denounce the presence of horse flesh in sausages.

My experiments, owing to the want of guinea pigs, have only been the following:

Guinea pig No. 1 was inoculated under the skin with 1 c.c. of horse blood serum, and seventeen days afterwards ½ c.c. of hog serum was injected into the jugular vein, and nothing happened. Half an hour afterwards it received horse serum (homologous) and died of analphylaxis, but taking a much longer time to die than the guinea pig used for the direct test, owing to a slight prophylactic action of the hog serum.

Guinea pig No. 2 was inoculated under the skin with juice of horse flesh obtained with salt and diluted. Eighteen days later ½ c.c. of horse serum was injected into the jugular, the animal dying two minutes after of characteristic anaphylaxis.

Guinea pig No. 3 received 2 c.c. of macerated donkey flesh, and eighteen days later ½ c.c. horse serum *without any anaphylactic alteration presenting itself*. Inoculated twenty-four hours after with ½ c.c. donkey serum, in three minutes anaphylactic manifestations appeared, the animal being unable to stand, but after some time it recovered and remained alive.

This experiment is very interesting and worth while following up, owing to the affinity between the horse and the donkey.

Guinea pig No. 4 was inoculated with 1 c.c. hog serum, and seventeen days after into the jugular with ½ c.c. horse serum: no manifestations appeared. One hour later ½ c.c. hog serum (homologous) was inoculated into the other jugular, the guinea pig dying in two minutes of anaphylaxis.

Guinea pig No. 5 received 1 c.c. of ox serum, and eighteen days after ½ c.c. of horse serum without any disturbance ap-

pearing. One hour later the animal died of anaphylaxis after an injection of ½ c.c. homologous serum.

Guinea pig No. 6 received 1 c.c. horse serum, and ½ c.c. hog serum; seventeen days later it was inoculated with ½ c.c. horse serum in the jugular, and died of anaphylaxis.

A seventh guinea pig inoculated with boiled albumin, died before the test.

Although the number of tests is not sufficient to establish definitive conclusions, it appears that anaphylaxis would be preferable to the precipitins for the differentiation of albumin. Nevertheless my experiments will be finished during this year, and it will then be possible to speak more positively.

Some Notes on Poisoning by Sorghum

(Andropogon Sorghum)

By LEWIS H. WRIGHT, College Station, Texas.

THE writer's attention was called to some cases of poisoning of cows by partially cured sorghum, by Dr. R. P. Marsteller, Professor of Medicine and Surgery, School of Veterinary Medicine, Agricultural and Mechanical College of Texas, College Station, Texas. These cows were seen by Doctor Marsteller, July 9, 1917. The history was that three cows were fed sorghum at 12:30 p. m. July 9. At 1:30 p. m. all three were noticed to be sick. No. 1 died at 2:30 p. m., No. 2 recovered in two hours, without treatment, but seemed stiff for several days thereafter. No. 3, when seen, was down prostrate, and slightly bloated. Treatment of ammonia water, turpentine and epsom salt was given. The animal gradually recovered in two or three days.

The symptoms shown were of the usual sorghum type, staggering, sudden dropping to the ground, muscular twitching, dilatation of the pupil, drowsiness, involuntary movements of the legs, and later coma, rapid forced breathing with weak, imperceptible pulse.

The unusual feature about these cases is that this sorghum was cut Thursday, July 5, allowed to remain in the sun to become partially dry and fed Monday, July 9, four days later. The leaves were dry enough so that they would crumble in the hand, and very little moisture was in the stalk. The sorghum was first growth and very immature, not having begun to head. The past season has been very dry.

Pammel, in his "Manual of Poisonous Plants," page 348, in regard to sorghum poisoning, states:

"The substance dhurrin $C_{14}H_{17}NO_7$ occurs according to Dunstan and Henry in young plants of a sorghum. A glucoside resembling that found in almonds also occurs; it differs, however, but is capable of being converted into hydrocyanic acid, HCN. The investigations made at this station show that the prussic acid is not present as such, but that it is liberated from a glucoside, (1) by an enzyme in the plant as in the case of sorghum poisoning, and (2) by the action of boiling water on the plant. Glucosides of this sort are in themselves harmless and are dangerous only when they liberate prussic acid. The experiments mentioned above also show that even dried plants may contain a very large amount of combined pursic acid. We should expect that such a fodder would be as fatal to stock after curing as when standing in the field. Experience, however, seems to prove the contrary. Enzymes rapidly becomes inactive when dried in the presence of protein substances, according to Dr. A. F. Woods, Chief of the Division of Plant Pathology."

In all the references looked up, the writer was unable to find any cases cited where dry or nearly dry sorghum had caused poisoning. This lack of material prompted the folloing experiments.

On July 9, 1917, a two-year-old Jersey heifer, weight 450 pounds, was fasted over night and on the morning of the 10th was given one and a half small handfuls of the sorghum, which she ate. No noticeable symptoms were

shown. On July 11th another two-year-old heifer, weight about 500 pounds, which had been fasted for thirty-six hours, was fed the sorghum.

8:25 a. m.—Given one and one-half handfuls.
8:50 a. m.—Animal lying down. Slapped and made to get up.
8:55 a. m.—Quite "groggy."
9:00 a. m.—Twitching of muscles and staggering.
9:10 a. m.—Down—severe convulsions—involuntary moving of legs. Slight bloat. T. 101° F. Pulse 140—weak. Res. 30. Treatment: One-half ounce of ammonia water poured in a pail on a piece of cloth and held about six inches from the patient's nose.
9:20 a. m.—Animal quiet. Res. 12, labored.
9:50 a. m.—Animal quiet. Res. 13, labored. Pulse weak and very fast. T. 100.2° F.
10:05 a. m.—Bloat quite severe, relieved by trocarizing rumen.
10:20 a. m.—T. 99.2° F.
10:25 a. m.—One ounce of aromatic spirits of ammonia, given through trocar. Animal propped upon the sternum. Typical "milk fever" attitude, head on side, eyes dull and sleepy looking.
10:35 a. m.—Pulse 120.
10:45 a. m.—Body and neck muscles twitching occasionally. Involuntary movements of legs.
10:50 a. m.—Two ounces of turpentine was given through trocar.
10:55 a. m.—One ounce of ammonia water in 8 ounces of distilled water was given through trocar.
11:30 a. m.—Urine drawn, saved and examined for cyanides. Negative. Animal has spasms about every ten minutes. Typical cyanide odor from nose. (Overstreet.)
1:00 p. m.—Animal quiet—prostrate.
2:00 p. m.—Animal quiet—prostrate. Occasional twitching of muscles, spasms brought on by a sudden noise, as in strychnin poisoning.
3:00 p. m.—T. 97° F. Outside temperature of air 111° F. in shade.
3:30 p. m.—Pulse 102.
4:30 p. m.—T. 97.8° F.
5:00 p. m.—Animal quiet, trocar removed.
7:20 p. m.—Animal quiet.
9:30 p. m.—Animal quiet.

July 12, 1917.

7:30 a. m.—T. 101.5° F. Pulse 90—regular and strong. Res. 26. Animal passed feces three times during night. Right foreleg paralyzed from rubbing on cement floor.
10:45 a. m.—Animal up and drank water.
5:00 p. m.—T. 101.6° F. Pulse 76. Res. 22. Ate a small amount of cut grass. Animal acts quite bright.

July 13, 1917.

8:00 a. m.—T. 101° F. Pulse 60. Res. 22. Right foreleg still paralyzed.

July 15, 1917.

Cow normal, except for foreleg, which recovered in less than a week.

A goat was fed on the same material for three days with no bad results. Two horses ate fairly large amounts of the sorghum, with no bad results. Both horses came off pasture, but at the end of the experiment one had a severe diarrhea. Lander, in his Veterinary Toxicology, gives diarrhea as a symptom of hydrocyanic acid poisoning. [It is often very difficult to kill horses with hydrocyanic acid. Cases have been reported where they lived as long as twelve hours after having been given a pint of freshly made Ac. Hydrocyan. Dil., U. S. P.—Editor.]

On July 15, 1917, Doctor Marsteller called the writer's attention to the following case: A cow in fine condition, *heavy with calf*, was turned into a field of first growth, immature sorghum which had been stunted by drought, after having fed on the lawn for some time. According to the owner, she dropped to the ground in five minutes. The patient soon bloated a little, and with the aid of a neighbor, she was drenched with two pounds of epsom salt in water and a stick was tied in her mouth to relieve the bloat. When first seen by the writer, about thirty minutes after first symptoms were shown, the animal was lying fairly quiet, with an occasional muscular twitch. Feces had been passed twice. Bloat was nearly all gone and the stick was removed from her mouth. A small amount of ammonia water was put on a cloth in a bucket and set before the animal for inhalation. Recovery was eventually complete in twenty-four hours.

Some of the sorghum was cut and brought home to be fed to horses and a goat to see if they could be poisoned.

(Continued on page 884)

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War-Quickened Progress

TREMENDOUSLY rapid times are upon us and ahead of us. On every hand there is progress—revolutionary change; changes have come about in the past six months, real progress has been made in myriad lines, that would hardly have been accomplished in a generation in normal times. The close of the year is a sort of stock-taking time with business and individuals alike; What has been accomplished? What adjustments have been made to changed conditions? What preparation for the coming year? *Am I keeping up? Has my duty been done?* These are questions each must ask himself, and none can avoid the answer.

In no other line perhaps has the World Wide War quickened progress more than in medicine and surgery, hygiene and the conservation of health; and veterinary medicine is attaining its own. An adequate veterinary corps for the army is in the procress of formation. Nearly a thousand veterinarians have been selected, chiefly from the ranks of practitioners, and suddenly confronted with problems greater than they ever imagined before; burdened with responsibilities greater than like men have ever borne, and have been given an incentive and opportunity to do and accomplish big things, such as the profession has never before known. Will progress come of it all? Watch it.

The responsibilities of veterinarians remaining in civil life are increased only in less proportion than those of the military. In the first place, we must by extra effort do the work heretofore done by ten percent of our number now withdrawn from civil life and we must do all our work a great deal better than ever before. This country is so rich in resources that in time of peace we could lose 100 million dollars annually through preventable animal disease without much attention being given it; but no such loss is tolerable now; it would mean want and hunger, it would in effect be direct aid to the enemy. Upon the veterinary profession rests the burden of preventing this appalling waste. The Bureau of Animal Industry is doing much to conserve the live stock of the country. Its hog cholera control work is being extended, a tuberculosis eradication campaign is under way, the fever tick is being crowded nearer the borders and some work in the control of other infectious diseases is soon to be undertaken, but the great bulk of the work of lessening the unnecessary loss from animal disease must be accomplished by the practitioner. Patriotism demands nothing less than our best in this. And again the question, *are we keeping up?* Are we prepared to give the best that is in us in service to the live stock industry, to the country and to the cause of world Democracy?

FOR WHICH WE APOLOGIZE

TWO splendid scientific articles that we planned to use this month were omitted. Our apologies to the writers. Fifteen to twenty interesting case reports have likewise been held over until next month, and again, our apologies are offered to the writers, several of whom have been written their articles would appear in this issue. The editor has fared no better, for his pet editorial of the whole year, the annual *resumé* of what has been accomplished during the year, in other words his indirect way of telling subscribers and proving to them that the AMERICAN JOURNAL OF VETERINARY MEDICINE is the livest, the most up-to-date and the greatest and the best veterinary journal that is or ever has been, was likewise crowded out this time, and unlike the omissions heretofore mentioned, it cannot be used next month, but is lost for all time.

The end attained must justify these omissions. It seemed pertinent at this time of taking stock, to give the very extended report that this issue contains of the veterinary books that have been published during the year, and to give the very complete list of recent bulletins of the United States Department of Agriculture, and the Dominion Department of Agriculture of Canada, and the various state agricultural experiment stations that treat of veterinary subjects. This report of current veterinary literature has required, all told, about a dozen pages ordinarily used for scientific articles and case reports.

The annual index, which alone makes available the fund of information in back numbers, took another dozen pages, and lastly, just as we were going to press, everything had to be rearranged to include the list of the promotions in the veterinary corps.

This seems a good place to emphasize the necessity for subscribers preserving their copies of the JOURNAL, for insisting upon the purchase of binders, if you please, to properly preserve them. We can talk about the sale of binders in the editorial department or anywhere else without apologies, for they are supplied subscribers without profit to the JOURNAL, but solely as a convenience and an inducement to them to preserve in a ready, available form, the great amount of information of permanent value that the pages of the JOURNAL contain.

Particularly should subscribers preserve their copies of the November and the December issues of the JOURNAL. These two issues contain the names of all veterinarians in the service of the army. Additional commissions will be noted as issued and promotions will be announced as made. The part acted by the veterinarians in the army is going to be an important one, and one upon which every veterinarian should take pride in keeping himself informed. To keep your record of the veterinary corps up-to-date, take the November issue now and mark off, in the list of the veterinary officers reserve corps, the names that are given in the present list of the veterinary corps, as having been promoted from the veterinary reserve corps; then save these copies as a part of the veterinary history of the war.

PROMOTIONS IN THE VETERINARY CORPS OF THE NATIONAL ARMY

The organization of the new veterinary corps of the national army is proceeding, as will be seen from the large number of commissions in it listed below. Few not engaged in this work of organization realize its difficulty. At present the status of the veterinary corps now being organized is not fixed, that is, the veterinary manual being compiled by the veterinary officers at Washington has not been approved and the officers of the veterinary corps assigned to divisions are restricted in their activities to the regulations of the old veterinary corps of the regular army. This will, of course, be corrected in time.

PROMOTIONS IN THE VETERINARY CORPS

To Be Majors, Veterinary Corps, National Army.

From civil life.

Harold Edward Bemis, Camp Funston, Ft. Riley, Kans.
Charles Edgcomb Cotton, S. G. O.*
Reuben Hilty, S. G. O.
Lewis Amos Klein, S. G. O.
Clarence James Marshall, S. G. O.
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Raymon Maxwell Staley, S. G. O.
John Pollard Turner, Camp Meade, Annapolis Junct., Md.
David Stuart White, S. G. O.

From Captains, Veterinary Corps, U. S. A. (Regular Army)

Coleman Nockolds, Camp Kearney, Linda Vista, Cal.
Ray J. Stanclift, S. G. O., Wash., D. C.
Joseph R. Jefferies, A. E. F.*
Harry F. Steele, A. E. F.

From 1st Lieut., Veterinary Corps, U. S. A.

Robert Vans Agnew, Camp Lee, Petersburg, Va.
Alfred L. Mason, A. E. F.
Henry W. Peters, 14th Cav., Del Rio, Tex.
William P. Hill, A. E. F.
Aquilla Mitchell, A. E. F.
Richard H. Power, A. E. F.
Jules H. Uri, A. E. F.

From 2d Lieut., Veterinary Reserve Corps

Harry Douglas Gill, Newport News, Va.
Morton Edmond Knowles, Camp Sherman, Chillicothe, Ohio.

To Be Captains, Veterinary Corps, National Army.

From 1st Lieut., Veterinary Corps, U. S. A. (Regular Army)

Lloyd E. Case, Honolulu, H. T.
Clarence Loveberry, Tientsin, China.
Robert C. Musser, Manila, P. I.
Edward P. O'Connell, A. E. F.
Walter Fraser, 85th Div., Camp Custer, Battle Creek, Mich.
Sherman L. Teeple, 83rd Div., Camp Sherman, Chillicothe, O.
Herbert S. Williams, Tenadores, 5th Field Artillery.
Ralph M. Buffington, Newport News, Va.
Andrew E. Donovan, Camp Lewis, American Lake, Wash.
Burton A. Seeley, 33rd Div., Camp Logan, Houston, Tex.
Burt English, Ft. Ethan Allen, Vt.
George A. Hanvey, Jr., Remount Sta., Ft. Sam Houston, Tex.
George H. Koon, 82nd Div., Camp Gordon, Atlanta, Ga.
Daniel B. Leininger, Ft. Riley, Kans.
George A. Lytle, 3515 Iron St., Chicago, Ill.
Thomas H. Edwards, Ft. Wm. McKinley, P. I.
Robert J. Foster, Camp Stotsenburg, Pappanga, P. I.
Fred B. Gage, Camp Stotsenburg, Pappanga, P. I.
John H. Gould, Camp Stotsenburg, Pappanga, P. I.
Charles H. Jewel, Schofield Barracks, H. T.
Walter H. Pick, Schofield Barracks, H. T.
Wilfred J. Stokes, Schofield Barracks, H. T.
William C. Van Allstyne, A. E. F.

From 2d Lieut., Veterinary Corps, U. S. A. (Regular Army)

Charles E. Channing, Camp Meade, Md., 79th Div.
Joseph W. Burby, 90th Div., Camp Travis, Ft. Sam Houston, Tex.
Joseph N. Hornbaker, Front Royal, Va.

From 2d Lieut., Veterinary Reserve Corps.

Robert Somerville Beattie, Newport News, Va.
Chauncey E. Cook, Ft. Reno, Okla.
Thomas William Churchill, West Point, N. Y.
Ralph Alexander Dunn, Newport News, Va.
Eric O. Ericson, Camp Custer, Battle Creek, Mich.
Homer Patrick Flowe, Ft. Riley, Kans.
Charles Joseph Griffin, Camp Jackson, Columbia, S. C.
Harry Percival Gill, A. E. F.
Harry Clinton McKim, Ft. Sam Houston, Tex.
William Wilson Richards, Ft. Sam Houston, Tex.
Walter Glenn White, Camp Hancock, Augusta, Ga.
Charles Wagner Gwinner, Camp Hancock, Augusta, Ga.
Harold Edward Egan, Front Royal Remount Depot, Va.
Howard Newell Beeman, Ft. Keough, Mont.
Lewis Edgar Beckham, Camp U. S., Ft. Marathon, Tex.
George Wallace Constable, 8th Cav., Ft. Bliss, Tex.
Ross Allen Greenwood, Painesville, O.
George Allen Jarman, 410 Scarrett Arcade, Kansas City, Mo.
Walter Scott Johnston, Camp Meade, Md.
Robert Crosswell Talty, 1911 F. St., Wash., D. C.
Roswell Oertling Byerrun, Chickamauga Park, Ga., 2d Div.
John H. Courtright, 410 Scarrett Arcade, Kansas City, Mo.
Phillip H. Fulstow, Camp Robinson, Wis., 16th F. A.
Donald Brompton Palmer, Newport News, Va.
Irby Rheuel Pollard, Ft. Clark, Tex.
John Martin Eshleman, Camp Hancock, Augusta, Ga.
Martin A. Ryan, Remount Dept., Ft. Bliss, Tex.
Edward J. O'Hara, Ft. Keogh, Mont.
Thomas D. James, 12 F. A., Ft. Myer, Va.
Frederick de Maurville Bertram, Camp Devens, Ayer, Mass.
Thomas Sterling Hickman, 1818 Cherry St., Kansas City, Mo.
August Frederick Lange, Aux. Remount Depot, Ft. S. H., Tex.
Wilton Wendell Webb, Camp Wheeler, Macon, Ga.
Martin Olthouse, Grass Lake, Mich.
Fern Leroy McCollister, Willoughby, O.
Luster D. Nowell, Aux. Remount Depot, Montgomery, Ala.
John B. Lentz, Camp Upton, Yaphank, L. I., N. Y.

From 1st Lieut., National Guard.

Harry W. Brown, Camp Sheridan, Ala. 135th F. A.
Albert N. Towner, Towners, N. Y.
Emlen Wood, Camp Hancock, Augusta, Ga.
Cage Head, Camp Wheeler, Macon, Ga.

To Be 1st Lieutenants, Veterinary Corps, National Army.

From 2d Lieut., Veterinary Corps, U. S. A. (Regular Army)

Thomas H. Jones, Buffalo, N. Y.
George W. Brower, Manila, P. I.
Elwood L. Nye, Schofield Barracks, Hawaiian Territory.
Allen C. Wight, 7th Field Artillery, A. E. F.
Wm. Alexander Aitken, 23d Cav., Chickamauga Park, Ga.
George Philip Bard, 8th F. A., Ft. Still, Okla.
Calvin Forrest Bennett, 5th Cav., Camp Stewart, El Paso, Tex.
Curtice Christopher Bourland, 22d Cav., Chickamauga Park, Ga.
Harold Clark, 2d Cav., Ft. Ethan Allen, Vt.
Everett Cooper Conant, 3d F. A., Ft. Sam Houston, Tex.
Raymond LeRoy Conklin, 4th F. A., Syracuse, N. Y.
John James Connolly, 20th F. A., Ft. Sam Houston, Tex.
Edward M. Curley, Ft. Bliss, 8th Cav.
William Henry Dean, 12th Cav. Columbus, N. M.
George Webster Derrick, 10th F. A., Douglas, Ariz.
Charles Brenton Dunphy, 11th F. A., Douglas, Ariz.
Clifford Ewen, 16th Cav., Brownsville, Tex.
William De Vane Faison, 7th Cav., Ft. Bliss, Tex.
Charles Edward Fanslau, 6th Cav., Marfa, Tex.
Alfred Gustav Gierke, 18th Cav., Camp Shelby, Miss.
Oscar Edward Gladfeather, 11th Cav., Ft. Oglethorpe, Ga.
Charles Oliver Grace, 11th Cav., Ft. Oglethorpe, Ga.
Joseph Napoleon Graves, 14th F. A., Ft. Still, Okla.
Will Charles Griffin, 1st Cav., Ft. D. A. Russell, Wyo.
Joseph Walter Hastings, 13th Cav., Ft. Riley, Kans.
Henry Emil Hess, 21st F. A., C. Wilson, San Antonia, Tex.
Forest Lee Holycross, Ft. Clark, Tex., 14th Cav.
Horace Z. Homer, 18th Cav. C., Shelby, Miss.
Owen Howells, 12th F. A., Ft. Myer, Va.
Harry John Juzek, 13th F. A., El Paso, Tex.
Paul Roberts King, 24th Cav., Ft. D. A. Russell.
James Alexander McCallam, 2d Battallion Mtd. Eng., Camp Stewart, Tex.
Robert Payne McComb, c/o Adjutant General, War Dept., Wash., D. C.
Daniel Henry Mallan, Ft. Myer, Va., 2d Battallion, 3d F. A.
Frank Columbus Meisner, Sioux City, Iowa.
John Dudley Moore, Adjutant General's Office, War Dept., Wash., D. C.

*A. E. F.—American Expeditionary Force, Address, via New York.

Charles Van Wil Morris, Chickamauga Park, Ga., Reorgan. Camp, 22d Cav.
Clarence Wm. Mould, Ft. Huachuca, Ariz.
Nathan Menzo Neate, 11th F. A., Douglas, Ariz.
Solon B. Renshaw, 17th F. A., Sparta, Wis.
George Leander Richards, 20th Cav., Ft. Riley, Kans.
Daniel S. Robertson, A. E. F.
Jarry Lewis Ruble, Ft. D. A. Russell, with 24th Cav.
Floyd Chauncey Sager, Pine Camp, Syracuse, N. Y., 15th F. A.
Robert Miles Sarde, 18th F. A., El Paso, Tex.
John Von Henry Schantz, 19th F. A., Ft. Sam Houston, Tex.
Louis Lathrop Shook, 19th Cav., Camp Shelby, Miss.
James Russell Sperry, 17th Cav., Douglas, Ariz.
George Stutsman, S. G. O.
Louis Goldman Weisman, 21st Cav., Ft. Riley, Kans.
Frank Holmes Woodruff, El Paso, 8th Engineers, mounted.
Vincent Brown Wright, 16th Cav., Mercedes, Tex.
Sherman R. Ingram, Office Q. M. G., Wash., D. C.
Samuel H. Saul, Camp McClellan, 29th Div.
George H. Dean, Temporary duty at Front Royal, Va.
Alexander G. Frazer, Remount Station No. 3, Leon Springs, Tex.

From 2d Lieuts., Veterinary Reserve Corps

James Henry Allen, A. E. F.
Asa Richard Andrews, Ft. Sam Houston, Tex.
James Joseph Ash, Ft. Sam Houston, Tex.
Harry Becker Balthaser, Camp Dix, Wrightstown, N. J.
Harry Elmer Barker, A. E. F.
George Kehs Bartholomew, Camp Dix, Wrightstown, N. J.
Ralph Mack Bell, Ft. Reno, Okla.
Charles Penrose Bishop, Camp Dix, Wrightstown, N. J.
William George Black, Camp Jackson, So. Car.
Charles Ralph Boshart, A. E. F.
Ivan Bertrand Boughton, A. E. F.
William Brod, Camp Hancock, Augusta, Ga.
William John Brown, Front Royal, Va.
Leland Adelbert Browne, Medical Supply Depot, St. Louis, Mo.
Floyd Leroy Buck, Remount Depot, Front Royal, Va.
Kenneth Earl Buffin, Camp Merritt, N. J.
Ora Lee Campbell. Ft. Jay, N. Y.
Guy Castleberry, 7th Cav., Camp Ft. Bliss, Tex.
Edgar M. Clark, Camp Cody, Deming, N. M.
Edward Isaac Cheely, 3d Field Art., Ft. Sam Houston, Tex.
Joseph Fenton Crosby, Camp Upton, Yaphank, L. I., N. Y.
James Webster Crouse, Camp Hancock, Augusta, Ga.
Jesse Daniel Derrick, Camp Dix, Wrightstown, N. J.
Seth C. Dildine, Camp Taylor, Louisville, Ky.
Leo A. Doherty, A. E. F.
Ralph Gilbert Effner, Ft. Riley, Kan.
William George Ellwitz, Camp Green, Charlotte, N. C.
Monroe Sublett Esslinger, Ft. Oglethorpe, Ga.
Harry Eastman Ewing, Scarrett Arcade, Kansas City, Mo.
Gerald W. Fitzgerald, Ft. Reno, Okla.
D. B. Fitzpatrick, Camp Meade, Annapolis, Jnc., Md.
Bartlette Berry Flowe, A. E. F.
C. M. Gilchrist, A. E. F.
Horace A. Gould, Camp Grant, Rockford, Ill.
Henry Harrison Haigh, Camp Upton, Yaphank, L. I., N. Y.
Raymond Augustus Halsey, A. E. F.
Richard Morgan Hampton, A. E. F.
Charles F. Henry, Scarrett Arcade, Kansas City, Mo.
Floyd Edwin Hill, Camp Sherman, Chillicothe, O.
Kenneth Fremont Hinckley, Camp Lewis, American Lake, Wash.
Harry Gurdon Hodges, A. E. F.
Daniel James Holton, Camp Meade, Annapolis Jnc., Md.
John Christian Hoover, A. E. F.
William Henry Houston, Ft. Reno, Okla.
Thomas Blake Howle. Ft. Reno, Okla.
David Morris Hoyt, Scarrett Arcade, Kansas City, Mo.
Joseph Evon King, Scarrett Arcade, Kansas City, Mo.
Louis Philip Koster, Camp Lee, Petersburg, Va.
Thomas Clements Koster, Newport News, Va.
Roy Eugene Kyner, A. E. F.
Morgan Baxter Lamb, Ft. Oglethorpe, Ga.
Armin Anton Leibold, Camp Grant, Rockford, Ill.
Edward Herman Lenheim, Ft. Riley, Kans.

From 2d Lieuts., National Guard

Elmer William Berg, Camp Albert Mills, Garden City, L. I. 151st F. A.
Nicholas E. Dutro, Camp Bowie, Texas. 132nd F. A.
George W. Grim, Camp Hancock, Augusta, Ga. 108th F. A.
Ernest W. Hogg, Camp Hancock, Augusta, Ga. 109th F. A.
James M. Kingston, 51st Brigade, F. A., Newport News, Va.
Joseph L. Klotz, 150th F. A., Newport News, Va.
Levi Eldredge Maddocks, Newport News, Va.
Carlton Parke Marcus, Camp McClellan, Anniston, Ala. 112th F. A.
Charles J. McAnulty, Camp Hancock, Augusta, Ga.
Harry Frank Nimphius, Camp Wadsworth, S. C.
John Anthony Wende. Camp Wadsworth, Spartanburg, S. C. 160th F. A.
Joseph E. Hodge, Camp McClellan, Anniston, Ala. F. A.

2nd Lts. V. R. C. Recommended for 1st Lts. V.C.N.A.

Josiah Tustin Little, Camp Upton, Yaphank, L. I., N. Y.
James Lorimer Lindsay, A. E. F.
Philip J. McCarthy, Camp Meade, Annapolis Jnc., Md.
Theodore Wilber McCullough, Camp Dix, Wrightstown, N. J.
John McTammany, A. E. F.
James R. Mahaffy, Front Royal, Va.
Henry Dunbar Martien, Camp Dix, Wrightstown, N. J.
Hadleigh Marsh, 14th Cav., Ft. McIntosh, Tex.
Frank Eugene Metcalf, Ft. Sheridan, Ill.
Charles Le Roy Miller, A. E. F.
Nelson Moffat, 12th F. A., Ft. Myer, Va.
Roland E. Mitchell, Camp Stewart, El Paso, Tex.
Joseph Gordon Moon, S. G. O.
John R. Morse, Remount No. 2, Ft. Sam Houston, Tex.
William Calvin Nickel, Camp Dix, Wrightstown, N. J.
Herbert Cline Nichols, Depot Quartermaster, Chicago, Ill.
James Earl Noonan, Camp Travis, Tex.
Timothy Francis O'Dea, Newport News, Va.
Robert Evin Oliver, Front Royal, Va.
Clell Bricker Perkins, Camp Lee, Va.
John Adam Phillips, Camp McClellan, Anniston, Ala.
Robert Porteus, Camp Lee, Va.
Orin Sexton Pruner, Camp Sevier, Greenvile, S. C.
Thomas John Quinn, A. E. F.
George Thomas Reaugh, Ft. Reno, Okla.
Wade Hampton Reinhardt, Ft. Reno, Okla.
George Jacob Rife, Ft. Riley, Kans.
Leo Joseph Roach, Camp Mills, Garden City, L. I., N. Y.
John J. Roberts, A. E. F.
Russell Alger Runnells, Ft. Benjamin Harrison, Indianapolis, Ind.
Edward Karns Sales, A. E. F.
Mirko F. Severovic, Camp Travis, Tex.
James Samuel Spikes, Brownesville, Tex.
Henry Kingston Steckel, Camp Green, Charlotte, N. C.
Sidney Walter Stokes, Ft. Sill, Okla.
Charles Mohler Stull, Presidio, Tex.
Frank Wilmore Taylor, Jr., 10th Engineers, Washington, D. C.
Benjamin Ray Thayer, A. E. F.
John Joseph Thomas, Camp Dix, Wrightstown, N. J.
Rollin M. Thomas, A. E. F.
William Maxwell Thomson, Front Royal, Va.
Henry E. Torgerson, Ft. Douglas, Utah.
Oliver A. Taylor, A. E. F.
Harold Clark Vestal, Newport News, Va.
Fred N. Winchester, Ft. Reno, Okla.
Howard Rhoads Wise, A. E. F.

Harold William Wolfe, Ft. Reno, Okla.
Francis Everette Worch, Camp Taylor, Louisville, Ky.
Ray Sedric Youmans, Camp Devens, Ayer, Mass.
Frank Jared Younglove, Camp Funston, Ft. Riley, Kans.

Vet. Surgeons of Regular Army.

VETERINARY CORPS, U. S. A. (REGULAR ARMY).

Barber, O. A., 1st Lt., Ft. Keogh, Mont.
Caldwell, G. L., 2d Lt., 14th F. A., Ft. Sill, Okla.
Cramer, E. J., Capt., Ft. Keogh, Mont.
Feazell, G. F., 2d Lt., 10th F. A., Douglas, Ariz.
Foster, Frederick, Major, Ft. Sam Houston, Tex.
Fritz, B. S., 25th Cav., Ft. D. A. Russell, Wyo.
Griffin, G. E., Major, S. G. O., temporarily.
Grutzman, Walter R., Capt., Ft. Oglethorpe, Ga.
Hansen, Ingild, 1st Lt., Southern Dept.
Hartman, J. L., 2d Lt., 5th Cav., El Paso, Tex.
Haynes, J. R., 1st Lt., General Hospital, Fort Bayard, N. M.
Herbott, W. K., 2d Lt., Ft. Ethan Allen; 10th Cav.
Huse, Gordon B., 4th F. A., Syracuse, N. Y.
Kintner, J. H., 2d Lt., 13th F. A., El Paso, Tex.
Lawler, W. J., Capt., Unknown (Can't be located but on duty).
Lusk, W. V., Capt., Temporary duty, 410 Scarritt Arcade, Kansas City, Mo.
McKinnon, J. A., 1st Lt., Manila, P. I.
McMurdo, C. D., Major Temp. duty, 410 Scarritt Arcade, Kansas City, Mo.
Martin, A. D., 2d Lt., Eastern Dept.
Schwarzkopf, Olaf, Major, Medical Supply Depot, St. Louis, Mo.
Shand, James R., 1st Lt., U. S. Military Hosp., China Expedition.
Sproule, W. A., 1st Lt., Corozal, Canal Zone.
Stroly, S. D., 2d Lt., 12th Cav., Columbus, N. M.
Timmons, J. W., Jr., 2d Lt., 6th F. A., A. E. F.
Turner, W. G., Major, Corozal, Canal Zone.
Woodson, Pickens E., 2d Lt., retired, Ft. Bayard, N. M.

VETERINARY SURGEONS TAKEN IN WITH NATIONAL GUARD

Alabama

Butler, Forrest Eugene, 1st Cav., Camp Wheeler, Macon, Ga.

California

Hill, James A., 1st F. A.
Kay, David Scott, Cal. Cav., Camp Kearney, Cal.
Nichols, Julian P., Cal. Cav.

Colorado

Martin, Earl Thompson, Camp Kearney, Cal.
Paxton, John D.
Slayton, Thos. N., F. A.

Georgia

Mount, Emanuel B., 116th F. A., Camp Wheeler, Macon, Ga.

Illinois

Trader, Rudolph L., 122d Art., Camp Logan, Houston, Tex.
McEvers, Geo. E., 122nd Art., Camp Logan, Houston, Tex.

Iowa

Mills, Redfield C., F. A., Camp Cody, Deming, N. M.
McLain, Willis H., F. A., Camp Cody, Deming, N. M.

Kansas

Rowles, Leslie W.
Young, Clarence L.

Louisiana

Ratigan, Wm. J., 1st La., F. A., Camp Beauregard, La.
Robertson, Earl W., 1st La., F. A., Camp Beauregard, La.

Maine

Lynch, Wm. Henry, Newport News, Va.

Michigan

Clancy, George E., Camp MacArthur, Waco, Tex.

Massachusetts

Dowd, Eugene A., Newport News, Va.
Eames, Harold N., Newport News, Va.
Shannon, Wm. H., Newport News, Va.

Minnesota

Fleming, Russell G., 2d F. A.
Palmer, Donald B., Newport News, Va.

Missouri

David, Ora P., 2d F. A.
Haller, Forrest.
Parker, Carl.

New Jersey

Riley, Timothy J.
Vanderroest, Henry G., 110 F. A., Camp McClellan, Anniston, Ala.

New York

Anderson, Charles E., 104th F. A., Camp Wadsworth, Spartansburg, S. C.
Caveney, Francis J., 106th F. A., Camp Wadsworth, Spartansburg, S. C.
Churchill, Thos. Wm., West Point, N. Y.
Hagan, Cornelius Edward, 3d Field Hosp. Co.
Johnson, August F., 105th F. A., Camp Wadsworth, Spartansburg, S. C.
Kettner, Harry E.
McAuslin, Robert A., 105th F. A., Camp Wadsworth, Spartansburg, S. C.
MacDonald, Jay, Q. M. C.
Goubeaud, Geo. J., 104th F. A., Camp Wadsworth, Spartansburg, S. C.
Ransley, Geo. N.
Shook, Louis L., Camp Wadsworth, Spartansburg, S. C.
Spartansburg, S. C.
Wermuth, John J., 102th Ammunition Train, Camp Wadsworth, Spartansburg, S. C.

North Carolina

Nathan, Simeon A., 113th F. A.

Ohio

Batsche, Jos. Henry, 136th F. A., Camp Sheridan, Ala.
Lunn, Frank R., 134th F. A., Camp Sheridan, Ala.
Wilcox, Arthur A., 112th San. Train, Camp Sheridan, Ala.

Pennsylvania

Bardes, Otto C., 109th F. A., Camp Hancock, Augusta, Ga.
Kernick, Henry J., 107th F. A., Camp Hancock, Augusta, Ga.
Laing, Edward J., 108th F. A., Camp Hancock, Augusta, Ga.
McAnulty, Chas. J., Cav., Camp Hancock, Augusta, Ga.
Quigley, Martin Le Roy, 107th F. A., Camp Hancock, Augusta, Ga.

Rhode Island

Jones, J. D., Camp Bartlett, Westfield, Mass.

Tennessee

Kord, Clemens E., 114th F. A., Camp Sevier, Greenville, S. C.

Texas

Dunn, Arthur W.
Haskell, Wm. H., 131st F. A., Camp Bowie, Tex.
Holzman, Jesse A., 132d F. A., Camp Bowie, Tex.
Richardson, Robert E.
Rucker, Daniel Ransom, 131st F. A., Camp Bowie, Tex.
Stephens, Howell F., 133d F. A., Camp Bowie, Tex.
Younger, Walter L., 133d F. A., Camp Bowie, Tex.
Zedlitz, Arthur F.

Utah

Coburn, Elmo P., 145th F. A., Camp Kearney, Cal.

Virginia

Ellott, Wm. H., F. A., Fort Oglethorpe, Ga.
Hudgins, Patrick H., 111th F. A., Camp McClellan, Anniston, Ala.

Wisconsin

Pilgrim, Stanley L., 120th F. A., Camp McArthur, Tex.
Schultz, Wm. C., 121st F. A., Camp McArthur, Tex.
Smith, Roy W., 121st F. A., Camp McArthur, Tex.

AVOID THE APPEARANCE OF EVIL.

Reports from several quarters, if true, indicate that some veterinary officers have ignorantly or knavishly compromised themselves by accepting favors from those who offer horses for sale for army remounts.

It is hard to conceive that any man having qualified as a veterinarian and been deemed fit material for an officer in the Reserve Corps would purposely commit offenses that can but characterize him as one most despicable. If such offenses are the fruition of gross ignorance, they are lamentable—in any event if such things are practiced, they constitute demoralizing and unpardonably disgraceful acts which reflect on the veterinary profession in a manner that is indeed unfortunate.

Believing that these reports may be founded on truth, it seems our duty to sound a warning on this matter to the end that any who might possibly be susceptible to compromise will resist temptation to violate their oaths and spare our army avoidable handicap; and, incidentaly, when veterinary officers do not remain true to our great cause, stigma will be attached on the veterinary profession of America. We sincerely hope that the foregoing admonition is not really necessary, we know it is unnecessary for the vast majority; nevertheless, the responsibility of the veterinary officer at the present critical moment is great and we think our bounds are not overstepped when we mention these reports which are not vague as we would hope.

Veterinary Books of 1917

Veterinary Obstetrics

W. L. Williams.
Professor of Obstetrics and Research Professor in the Diseases of Breeding Cattle in the New York State Veterinary College at Cornell University. Pages, 630; 140 Illustrations. Price, $5. Published by the Author, Ithaca, N. Y.

This is the first volume of a revision of the author's well-known work, "Veterinary Obstetrics, Including the Diseases of Breeding Animals and of the New Born" that appeared in 1909. Originally the work was in one volume, the present plan is to divide these subjects into two volumes. This volume dealing with subjects relating directly to obstetrics and a companion work to appear later dealing with the diseases of the genital organs, including those diseases of the young animal transmitted from the mother *in utero* or through the milk.

The changes in the discussions of the subjects included in the present volume from those of the original work are not revolutionary as one might infer from reading the author's preface, nevertheless, they are important and amply justify the revision. Next to the omission of the discussion of "Dangers and Infections of Coition," "Sterility and Its Treatment," and "Artificial Impregnation," the principal change which the revision shows is a rearrangement of the subject matter which admits of its presentation in better form, a notable improvement since a poor arrangement was the greatest fault of the original volume at the time of its publication. The rearrangement has eliminated considerable repetition and by so doing enhanced the value of the text. The principal changes in the subject matter have been an improvement in the style, elimination of ambiguities and the correction of errors which invariably creep into a first edition.

This work deals in order with anatomy of the generative organs, obstetrical physiology, including embryology, pregnancy and a very complete discussion of methods of diagnosing pregnancy, the diseases of pregnancy including dystocia, wounds and injuries of the genital organs, puerperal infections and puerpal eclamptic diseases.

In this work perhaps to an even greater extent than in other works of the author, the statements made are positive, unqualified and unequivocal, in a sense dogmatic. The reader is not left in doubt as to the author's opinion on any given subject. Sometimes he states that his opinion is diametrically opposite to that of other writers on the subject, as in his discussion of the relative frequency of dystocia in the mare and

in the cow, but he maintains his opinion nevertheless and his large clinical experience and his conspicuous success in his chosen field lends great weight to these opinions. The reviewer does and every reader probably will disagree with the author on some points. This is expected with any work, but considered as a whole, we must regard this as, indeed, a very high class work, an important contribution to the available information on the subject of veterinary obstetrics and an inspiration for study and observation.

Fistula of the Withers and Poll Evil.

Major L. A. Merillat, Sr., V. C. N. A.
Editor Surgical Department, American Journal of Veterinary Medicine.
Pages, about 140; well illustrated. Price, $1.50. Published by the American Journal of Veterinary Medicine, Chicago.

This little work might be termed the "stormy petrel" of veterinary literature for 1917. Its progress from the title page to the last chapter has been through difficulties and over obstacles that would have caused to be abandoned a work for which there was less insistent demand. Early in the spring the author yielded to importunities to place on the printed page the very definite conclusions to which he had arrived as to the treatment of fistula of the withers and poll-evil, as a result from his extraordinarily large and in many respects, unusual experience with these ailments.

It appeared that the manuscript might be completed by June 1st and certainly not later than the first of July, and a premature announcement of the publication was made. As an evidence of the high regard in which the author was held or of the popularity of the subject or of the unusual desire for information upon this subject, or perhaps a result of a combination of all three, was the immediate receipt of advance orders for nearly one thousand copies. After that, its publication was assured. Only one thing could meet such a demand and that was a book on this subject by L. A. Merillat. Hindrances to the preparation of the manuscript came thick and fast.

It was not until early fall that the section on Fistula of the Withers was written, and not until Major Merillat had taken up active duties in the army camp; in fact, not until he had completed his preliminary veterinary organization for the Forty-first Division and been ordered to Camp Mills, that the second part, the discussion on poll-evil was written. It was written in an army tent at Camp Mills, the author occupying one camp stool and his trusty typewriter another, no desk or work of reference about, and the memory of a steam heated flat, as he put it, "seemingly a million years away."

This is a work no veterinarian can escape. If he is satisfied with his knowledge and treatment of fistula and poll-evil, he must read this in self defense to be able to maintain his position with others. If he is desirous of learning more of these subjects, he must read it, for herein is included a discussion more comprehensive by far than all other writings on this subject combined. If he dislikes surgery and would not do a fistula operation "on a bet," he must read this to justify his attitude. If he has a hankering for surgery and is not displeased with gore, this work offers him greater satisfaction than anything else in print.

At this writing the book is not quite complete, but is well on the way and will be ready in a few days.

Principles and Practice of Milk Hygiene

Louis A. Klein, V. M. D.
Professor of Pharmacology and Veterinary Hygiene in the School of Veterinary Medicine at the University of Pennsylvania, and Dean of the Faculty.
Pages, 321; 41 Illustrations. Price, $3. Published by J. B. Lippincott Company, Philadelphia.

The purpose of the author in writing this book, as stated in the preface, has been "to present systematically, in concise form, the facts and principles which are of importance in the practice of milk hygiene and to describe how they may be applied in the inspection of dairy farms and in the examination of milk." The author acknowledges a large number of works as being the source of the material used in the work, and one can but say that his selection of material has been made with discernment of the real needs of the milk and dairy inspector.

Enumerating categorically the subjects discussed, we find: Physiology of

milk secretion, colostrum, milk, bacteria in milk, milk defects, influence of disease upon milk, dairy farm inspection, pasteurization, and methods of examining milk.

Numerous half-tones and other illustrations are included in the text, and add not a little to its value. Of the nine chapters, of which the work is composed, the chapter on Dairy Farm Inspection is easily the most practical, the one of most importance to the beginner in milk inspection and a welcome guide to the more experienced.

Bovine Tuberculosis.

J. F. Devine, with the Collaboration of E. Z. Russell, D. F. Luckey, and O. E. Dyson. Pages 120; 7 Illustrations. Published by American Journal of Veterinary Medicine, Chicago, 1917. Price $1.00.

This little book has been carefully prepared so that nothing of importance is left out in the discussion of bovine tuberculosis, from an educational standdairy animals to find them readily available.

Under "Control and Eradication," the various methods are discussed, among point, whether the reader be a veterinarian, student, sanitarian, dairyman, breeder, or public health official; and it can be recommended to such with a view to supplying useful knowledge without the fear of misleading or misinforming its readers.

The book starts well with an introduction by E. Z. Russell in which he clearly shows the importance of the control and eradication of bovine tuberculosis from a purely business or economic standpoint; also as a health problem. He plainly shows how the estimated loss of about $25,000,000 yearly from tuberculosis is borne by the producers, the packers, and the consumers. The great importance of thorough and effective cooperation of health officials, with the various city and town boards of health, through the enforcing of ordinances prohibiting any milk being sold or consumed within their jurisdiction, except from cows that have successfully passed the tuberculin test, is clearly set forth.

The question of compensation for tubercular condemned animals is discussed, and various plans suggested.

Dr. DeVine goes briefly over the history of bovine tuberculosis and discusses the contributory factors in the spread of the disease; the most important being, first, "Traffic in Cattle," and second, "The feeding of milk containing the living germs of tuberculosis to young calves." The disaster of cattle traffic is chiefly seen in large dairy herds, where it is the custom to purchase animals, frequently in order to replace those which are not productive. This is done without any special care being taken to determine if these new animals are free from tuberculosis; and, in the second place, the danger of infected milk is often made plain, particularly in herds where it is the custom to feed the calves raw skim milk taken from the miscellaneous supply given out by creameries.

The remedy for these conditions lies in the hearty co-operation of all concerned, in the dissemination of accurate knowledge concerning the disease, and in aiding the building up of tuberculosis-free herds, thereby making it possible for those who are seeking to purchase healthy these are (1) "The physical examination and immediate slaughter of all animals apparently affected with tuberculosis; (2) The physical examination and tuberculin test, at the same time destroying all animals that show evidence of the disease either by the test or physical examination; (3) The rearing of non-tuberculosis animals by immunization of the young; (4) The Bang method; (5) The Ostertag method; (6) Professor Poel's method; and (7) The "Modified Bang method" which would appear to be the most practical one for American conditions."

Under diagnosis the two most practical methods of determining the presence of tuberculosis in a herd are discussed; first, the physical examination, and second, the tuberculin test, either subcutaneous, intradermal, or ophthalmic.

While acknowledging that careful physical examination has much merit in reducing tuberculosis, yet I think that most men of wide experience with bovine tuberculosis will agree with the author that an attempt to control and eradicate tuberculosis by means of physical examination alone would be slow progress.

The lucid description of the proper methods of making and recording the various tuberculin tests, adds much interest for the reader, especially the contribution by Dr. Luckey on the advantages of the "Intradermal test," which seems to me the best description of this test that has ever come to my notice.

The contribution to this book on "The State Accredited Herd" by Dr. Dyson contains much practical advice, from an expert, on the necessity for co-operation of the state and federal authorities in the control and eradication of bovine tuberculosis as a national problem.

The book can be highly recommended as an important contribution to public education on the subject of bovine tuberculosis.—W. Reid Blair, in the *Jour. of the A. V. M. A.*

Special Equine Therapy.

By Mart R. Steffen, V. S., M. D. C. Pp. 212. Published by the AMERICAN JOURNAL OF MEDICINE, Chicago. 1917. Price $2.00.

This work forms No. 14 of the Veterinary Medicine Series, edited by D. M. Campbell. The series contains a number of very useful works which are well known to those British veterinary surgeons who are sufficiently wise to extend their reading to books published outside of their own country. The volume now before us may be described as a very valuable addition to the series. The author, in his preface, states that special attention is given to diseases and conditions which are unamed, atypical, or of infrequent occurrence, and we think that in the selection of these he has displayed considerable skill and good judgment.

In the introduction, the limitations of the practice of veterinary medicine from a commercial standpoint are considered, and herein the young practitioner will find much useful counsel and advice.

In the chapter entitled "System in Medication," the importance of respecting the *vis medicatrix naturæ* is impressed on the reader, also the question of proper dosage in prescribing remedies, and the value of simple treatment.

On page 15, we learn that the disease in horses known as contagious pustular stomatitis is communicable to man, and may assume a very serious course in the human subject.

Myxoid degeneration of the bones of the skull is described on page 21, and the clinical features of a case of this peculiar affection are recorded. As affecting the frontal sinuses we think the condition is more common than is usually imagined.

On page 24, acute infectious pharygitis is considered, but we would be inclined to regard the condition as one of the phases of strangles.

A very useful article on the subject of "Choking in the Horse" is found on pages 35 to 41, and the treatment of the spasmodic form of this condition by means of pilocarpin and apomorphin is well worthy of the consideration of practitioners.

On page 63, an affection termed "Pseudo-Hysteria of the Unsexed Male" is described. So far as we are aware this condition has not previously received notice in veterinary textbooks. We have met with two cases of the kind in geldings, but both were, previous to the attacks, docile animals in regular work, and in addition to the symptoms mentioned by the author, violent fits of kicking, squealing, and the involuntary passage of urine, were present.

Lack of space prevents us from drawing attention of the various interesting affections included in this book, and we can with confidence advise our readers to obtain a copy, and study it for themselves.

The treatment advised may be described in may instances as novel, but this fact increases the value of the work.

Of course, there are many points on which a reviewer may be permitted to differ from the author. For example, on page 90 it is stated that "diabetes mellitus is much more common in horses than is generally held to be the fact." It would be interesting to get an idea of the number of cases of this disease which have been met with in the horse, as up to the present, the instances recorded are few in number.

We must admit, however, that urinalysis is seldom carried out as a routine factor in diagnosis, hence it is possible that cases of diabetes mellitus may be overlooked. As, according to the author, the termination is nearly always fatal, we fail to see how the therapeutist will benefit either the patient or the client by attempting treatment. Under the heading of "Strangles" it is stated that "occasionally older horses become affected." This is not our experience as we encounter the disease in animals of all ages. In the clinical description of the disease, an enlargement of the submaxillary glands is included amongst the symptoms, which are said to occur in probably 90 per cent of all cases. This is not in accordance with our experience.

In the section on "Diseases of the Heart," we find the statement that "heart diseases *per se* are quite rare in the horse, and they may almost be said to occur only as a sequel to some acute infectious disease." We think it would be more advisable to state that cardiac diseases are often overlooked in the horse, and are not infrequently discovered as a surprise at post-mortem examinations.—E. W. HOARE, F. R. C. S. S. in *The Veterinary News,* London.

The Clinical Pathology of the Blood of Domesticated Animals.

Samuel Howard Burnett, A.B., M.S., D.V.M. Professor in Comparative Pathology, New York State Veterinary College, Cornell University, Ithaca, N. Y. Second Edition, Revised and Enlarged. Pages 160; 23 Illustrations. Published by The MacMillan Company, New York, 1917. Price, $2.25.

This is a book that we should expect to become more and more in demand as the scientific attainments of the average of the profession improves, and such appears to be the case.

The value of an examination of the blood varies in different conditions. It affords sufficient information to make a diagnosis in only a few diseases, but it gives a more or less valuable assistance in a very large number of conditions, such as secondary anemia, sepsis, suppurative processes, intestinal helminthiasis and hemorrhagic diseases. In addition to this, finding that the blood is normal is often a great help as it enables one to differentiate from the diseases in which the blood is not normal, and it many times indicates the condition present by the process of exclusion.

The subject is presented in a very systematic manner. In chapter No. 1, methods of examination are described lucidly and concisely, the explanations being such as to enable a veterinarian without especial laboratory training to make the examinations readily. Following this there is given a brief discussion of the morphology of the normal elements of the blood and then a discussion of the normal blood of the various species of domestic animals.

Having described the methods of making an examination and explaining what the student's may expect to find as normal in the blood of various animals, the author then takes up a discussion of the findings in pathologic conditions.

The large number of colored plates are a very valuable part of the work, really an indispensable part of it, since they show the beginner what to look for and what he may expect to find.

Epizootics and Their Control During War.

Dr. Herman Meissner
Professor of Hygiene and Director of the Hygienic Institute of the Royal Veterinary College, Hanover. With 37 Illustrations. Translated by A. A. Leibold, D. V. M. Published by American Journal of Veterinary Medicine, Chicago, 1917. Price, $2.00.

In the present great war, the importance of veterinarians with the armies has been given full recognition and the profession is cognizant of its many responsibilities toward aiding the fighting forces by proper care of the animals and by controlling the disease to which they are at all times exposed. It is a recognized fact that during previous wars, dangerous infections and contagious diseases have followed the wake of the armies, and furthermore, the fighting forces were many times hampered by outbreaks of diseases among the horses which crippled the forces sometimes at their greatest emergency.

The progress of the last decade in preventive medicine and sanitary science has enabled the veterinarians in this great war to effectively guard against threatening infections; and up to date the achieved successes of the veterinary profession command the greatest admira-

(Continued on page 885)

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
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Recent Literature on Poisonous Plants

By L. H. PAMMEL

A number of interesting papers on poisonous plants have been published during the past year. I have tried to summarize the important points that have been made and put them together for the benefit of the veterinary profession. I also confess that the amount of time at my disposal would not permit me to thoroughly scan all of the literature. The most important contributions made in the United States are those of C. D. Marsh, A. B. Clauson and Hadleigh Marsh on lupine as a poisonous plant and the paper by the same authors on larkspur poisoning of live stock. These papers give us some important and first hand information on the action of the poisonous plants of the general *Lupinus* and *Delphinium*. Most of our information heretofore has been taken from the experience of stock men and general observations.

The Bureau of Plant Industry of the United States Department of Agriculture has issued a bulletin on live stock and poisonous plants. They make the statement that losses from infection and from wild animals are very slight compared with those from poisonous plants. For instance, larkspur may cause a loss up to ten per cent death; camas and lupine may cause a loss of 10-60 per cent.

Strychnin Poisoning

Dr. Liautard[13] reports an interesting case of poisoning from strychnin as reported in Veterinary Record. An animal suffering from impaction of the rumen was given a purgative. The next day when the animal was convalescent two grains of strychnin hydrochlorid were given and repeated the next day. An hour after the injection she showed muscular tremors. These soon passed off. The following day the animal's appetite was good, bowels regular. Two more grains of strychnin were administered with the result that violent tetanic spasms took place. She died in ten minutes.

[13]Journal of American Veterinary Medical Association, 50:383.

Toxic Action of Phenol

Martin L. Wilbur[14] in a paper on "Some Fallacies regarding Phenol" reviews some of the literature regarding the toxic action of phenol.; also reporting on some original experiments. He finds in experiments with animals that the addition of ethyl alcohol to solutions of phenol in water does not in any way inhibit the toxic action of phenol, but rather tends to facilitate absorption and thus hasten death.

Beri-beri and Polyneuritis Gallinarum

Evidence seems to accumulate that these diseases are caused by the deficiency of some as yet undetermined substance. Beri-beri is caused by the use of over-milled or polished rice and that disease can be prevented by undermilled or cured rice. In no case did poisonous symtoms follow. Thus *Macrozamia spiralis* which is said to produce rickets in animals was wholly noninjurious when sufficient other nourishing food was given.

Case of Poisoning from Solanum Dulcamara

S. Hilberts[15] reports a case of poisoning from *Solanum Dulcamara* the so-called bitter sweet which is occasionally grown in Iowa as an ornamental plant. The symptoms of poisoning to a girl who had eaten the red berries of the plant were vomiting, gastric pain, headache, dizziness, cardiac palpitation, anguish, flushed face, pulse rate of 120 and occasional intermission of pulse beat besides visual disturbances. This plant is related to belladonna and black henbane.

The Alkaloids in Belladonna

A. F. Sievers,[16] who has made a study of the effects of selection on the production of alkaloids in belladonna, found from a previous investigation that a wide range of variation exists in the alkaloidal content of belladonna plants. He selected some plants

[14]American Journal of Pharmacy, 88:364-369.
[15]Muench Med. Wochen, 1915:1785; Clinical Medicine, 1916:518-519.

with a high alkaloidal content. The investigation showed that the first generation plants secured from seed of cross pollinated selected individuals display the characteristic of the maternal parent with regard to alkaloidal productivity. Plants grown in Madison, Wisconsin, and Arlington, Virginia, showed a greater amount of alkaloid in Madison. The Timmonsville, South Carolina, plants showed a still greater amount of the alkaloid. The variation in the amount of the alkaloids indicates that this is not due alone to climate. Soil may also have an influence. High alkaloidal content is probably inherited. May not the difference which arises in poisoning from different plants be due to their variation in individual plants?

Black Henbane

I have received several times from different parts of Iowa black henbane (*Hyoscyamus niger*). Dr. G. W. Blanche called my attention to this very poisonous weed near Belle Plaine, and another batch was received from Mr. W. L. Spray of Salem, Iowa, and another from J. F. Worman of Hazelton, Iowa. The mydriatic action of the drug of this plant is well known. It would be well to have all of the plants destroyed where they occur.

Spurge

Several different parties have sent to me one of the European spurges (*Euphorbia Lathyris*). Like many of the other spurges the juice is acrid.

Goldenrod Poisonous

Some years ago goldenrod was accused of causing a disease in horses in Wisconsin. Since then little has been written on the subject. Prof. P. A. Lohenbauer of the University of Nevada writes me that on a ranch near Reno, Nevada, a rancher lost quite a number of sheep. The *Solidago spectabilis* was common on this range. The plant was later fed to sheep in which the same symptoms were reproduced.

Milkweed Poisonous

A correspondent of mine, Mr. E. L. Dumm[17] of Newark, New Jersey, during the summer wrote me about a sickness in a lot of young chickens belonging to Mrs. M. A. Bates of Reed's Ferry, New Hampshire. A prominent symptom was the drowsy appearance of the young chicks as though they had been given some opiate. Mrs. Bates writes that the young chickens were dying by the dozens. In the fall another batch of chickens was removed to a clean yard in which a large and vigorous growth of the large milkweed (*Asclepias syriaca*) occurred. After a few days these chickens began to die. Mrs. Bates reports that after the removal of the milkweed the chickens stopped dying. Several milkweeds have the reputation of being poisonous. The juice is irritating and contains an opiate and the substance asclepion.

Soap Plant

The soap plant or amale (*Chlorogalum pomeridianum*) according to Burnham[17] produces a somewhat foamy substance in water. This material has a stupefying action on fish and other animals.

A Case of Poisoning from Bran

Dr. J. Franklin Drake of Webster City writes of a peculiar idiosyncrasy as follows: "I have a case of tubercular peritonitis under care. No use burdening you with details, but the profession has no drug as yet that will remove the fluid accumulating in such a case. With this man we had constipation and I advised the use of bran. He used it—about three tablespoonsful. The laxative action was so rapid, his wife thought she would use it. For twenty-four hours I never saw a case of ptomain poisoning more radical in the vomiting and purging than in this woman. By elimination and study of the situation the chemical is in this bran that did the work. No fluid has returned. The bran was made in a local mill with all the precaution it seems to me that could be taken for cleanliness."

Boneset

In my treatise on "Poisonous Plants" a few years ago I published all the data available on this plant. I reached the conclusion that boneset (*Eupatorium ageretoids*) and some of the related species caused the disease trembles. Subsequently Crawford[18] was unable to prove that common boneset produced the disease known as "trembles." In several subsequent papers it was maintained that aluminium phosphate is the toxic principle. I am glad to report that Professor F. A. Wolfe of the North Carolina Agricultural Experiment Station has conducted some experiments with *Eupatorium agerotoides*. He writes me in a letter that since the middle of June he has been feeding this weed to sheep and that he has caused the death of a dozen individuals. He is firmly convinced that the weed is the cause of this trouble. The paper will shortly be published.

Ergot of Paspaleum Poisonous

H. B. Brown[19] who has given an account of the life history and poisonous properties of *Claviceps paspali* finds it is poisonous to certain animals, especially to cattle and pigs. It produces a peculiar nervousness, resembling considerably that shown in certain stages of

[16]Some effects of selection on the production of alkaloids in belladonna. Professional paper. Bulletin of United States Department of Agriculture, 306: 1-19, 10f.

[17]American Botanist, 21:48.
[18]Medical Record, 75:77.

rabies, and if eaten in quantity may cause death. A gram of extract made from this fungus, although probably containing other substances in addition to the poisonous element, will, if fed to a guinea pig, cause death within a few hours. Many cattle running on pastures in which the diseased grass is plentiful perish when under the influence of the poison by getting down in the pasture out of reach of water and feed. A good many others, too, perish by drowning in pools or ponds of shallow water. They fall into the water in a nervous paroxysm and drown before getting over it.

Guinea pigs used in feeding experiments showed nervousness after being fed fifty sclerotia that had been picked from old heads of *Paspalum dilatatum*. Continued feeding produced death within a week or less. In most cases the sclerotia were given in doses of twenty-five a day. In feeding experiments carried on during the summer of 1915 it was found that sclerotia that had been in the laboratory for about ten months was poisonous and that a small amount of the extract of *(Claviceps paspali)* exposed to air and hot summer temperature was still active after a period of about ten months.

A guinea pig fed forty grass spikelets daily for seven days, each containing a mass of (*Claviceps paspali*) tissue in the sphacelia, or honeydew stage, and sixty each day for the next thirty-six days, showed no bad effects, but gained in weight. Another pig fed twenty-five young sclerotia daily for seven days and forty daily for the next twenty-one days showed no bad effects, but gained in weight slightly. This feeding was started on July 16. The last two experiments seems to indicate that it is only the old sclerotia that are poisonous. The experience of farmers with cattle on pastures indicate the same.

Trefoil Dermatitis

Sidney Dodd[20] in a paper on *Trefoil dermatitis* discusses the sensitization of unpigmented skin to the sun's rays by the ingestion of trefoil. A disease known as "aphis disease" has existed for a good many years in parts of New South Wales because it is believed by a great many stockmen to be due to plant lice or aphids. It has been observed that the disease in sheep is mainly coincidental with the shearing season. It also occurs when trefoil is green and abundant.

The symptoms of the disease are that in sheep after being shorn, the skin along the back becomes swollen. An exudate then appears on this part which may dry up in the form of crusts or scabs. There is intense itching of the afflicted area and the animal bites, rubs or scratches it, with the result that considerable areas may be rendered quite raw. When the ears or nose are afflicted the parts become swollen with an accompanying exudation of a yellow, sticky fluid (plasma) which often forms thick crusts.

Dr. Dodd conducted some experiments with trefoil (*Medicago denticulata*). It is not necessary in this connection to give the details of the guinea pig experiment, suffice it to say that the feeding of guinea pigs upon an exclusive diet of trefoil and exposing them at the same time to direct sunlight resulted in erythema and inflammatory edema of the skin, *i. e.*, reddening and swelling of the skin accompanied by exudation of plasma. It was only the unpigmented skin that was affected and apparently when such skin is protected from the sun, e. g., by a thick covering of hair even, it may escape. When experimentally induced the symptoms start in about eight days. The author then calls attention to fagopyrismus which is a dermatitis resulting from the ingestion of buckwheat and *Polygonum Persicaria* in connection with the action of sunlight upon unpigmented skin. The degree of cutaneous reaction is said to depend on the intensity of the sun's rays. The paper also gives a brief discussion of clover diseases in Europe. It is said to consist of inflammation of the white portion of the head and limbs. This is said to have been observed especially in horses in Scotland after feeding on fresh alsike clover (*Trifolium hybridum*). In cattle it may occur in the udder. Cutaneous lesions have also been observed after feeding large quantities of alfalfa (*Medicago sativa*). T. B. Rogers[21] has recently contributed an article on the sensitizing action of St. John's wort for unpigmented skin. He finds that the symptoms are those described for the trefoil above.

The Etiology of Pellagra

Edward J. Wood[22] has previously suggested that the relation of corn to pellagra was analogous to the relation of rice to beri beri. The author believes that there is a deficiency of vitamin in grain food and may be replaced by an abundant protein diet of fresh lean meat, fresh milk and eggs. The author cites a considerable literature applicable to an exclusive diet.

California Poison Oak

According to S. H. Burnham[20] some per-

[20]Journal of Agricultural Research, 7:401-405. Other literature by H. B. Brown and E. M. Ranck Tech. Bulletin of Mississippi Agricultural Experiment Station, 6:35p, 18f, 1915.

[20]The Journal of Comparative Pathology and Therapeutics, 29:47-62.

[21]American Veterinary Review, 46, No. 2.

[22]The American Journal of Medical Sciences, 152: 813-823.

sons are extremely sensitive to the action of the *Rhus diversiloba* which is quite similar to our poison ivy. However, according to Miss Parsons[24] horses eat the leaves without injury and the honey which the bees distill from the flowers is said to be excellent. This author recommends the resinous secretion of grindelia and a wash made from the Manzanita *Cascara sagrada* to counteract the bad effects of the poison oak. Since the poison is soluble in alcohol and in alkalies, the best preventative of poisoning after exposure is to wash the parts with alcohol or with alcohol containing a little dissolved sodium hydroxide. In the absence of alcohol, gasoline may be used. An aqueous solution of soap is also effective.

Poison Ivy Poisoning

An investigator states that the poisonous content of poison ivy is neither volatile nor water soluble. The poison exists in the form of a thick emulsion which readily sticks to the hands and clothing and which under certain conditions may retain its activity for months or years so that poisoning may take place at any time.

A. C. Reppeto[25] reports that calcium sulphid proved useful in the treatment of rhus poisoning or poison oak poisoning in Oregon.

G. H. Heald[26] reports that chewing the leaves of the California poison oak is a prophylactic.

Poisoning from Pawpaw[27]

Some persons are poisoned from the fruit like poison ivy poisoning. These cases of poisoning are due to a constitutional idiosyncrasy.

The Poisonous Action of Boston Ivy (Ampelopsis Tricuspidata)

The Japanese ivy or Boston ivy is widely cultivated in the southern part of the United States and is a handsome ornamental plant. The leaves are three-lobed and in some cases three-foliate. The fact that it is a three-leaved ivy sometimes causes it to become confused with the poison ivy plant. My attention was called to an interesting case of poisoning from this plant in Kansas City, Mo. My informant, The Iowa Seed Co., tells me they were threatened with a suit for selling what was alleged to have been poison ivy. Upon investigation, however, it was found that the plant in question was the Boston ivy with three leaflets. As nearly as I recall the situation it was this: a lady who had purchased the plant for Boston ivy had planted it in her yard near the house. After removing the weeds in the vicinity she became affected with a genuine case of poison ivy poisoning. The attending physician so diagnosed the case. After the usual prescriptions and medications the patient recovered. It was proven satisfactorily that the plant in question was Japanese ivy and the seed house paid the doctor's bill. The poisoning from this plant is probably due to a peculiar idiosyncrasy. Some people are much more sensitive to the action of these irritant plants than are others. I should like to know if there are any other cases of similar poisoning from this plant.

[24]The American Botanist, *21*:46-49.
[25]"The Wild Flowers of California."
[26]Clinical Medicine, *1916*:1034.
[27]Clinical Medicine, *1916*:1034.
[28]The Journal of Heredity, 8:30-31. See another article by M. A. Barber, Journal of American Medical Association, 1905-December 30.

FRIGHTFUL WASTE BY PREVENTABLE DISEASES

The stamping out of preventable diseases is another matter of prime importance. Armour & Co.'s books showed a loss in one year of over $1,000,000 by post-morten condemnation of carcasses after the animals had passed inspection on the hoof. Competent judges estimate at $100,000,000 annually the total economic waste due to stock diseases. Much of this can be prevented, and Armour educational work is being directed toward this end.

It is important to the welfare of the country that constantly growing population shall not outstrip the development of the live stock industry. To encourage greater production, Armour & Co. provide cash markets and ready outlets close to the farmer's supply source.—F. M. Harris, Armour & Co.

LOSSES TO LIVE STOCK FROM POISONOUS PLANTS

15:517.

The Journal of Forestry makes the following statement:

Forest Service reports give the information that approximately 7,000 head of cattle on the National Forests were lost during 1916 from eating poisonous plants. Of this number at least 90 per cent were poisoned from eating tall larkspur: this 90 per cent were valued at $300,000. The principal losses occurred in the higher ranges of the states lying between Washington and New Mexico.

[29]Public Health Reporter, *1916*:1907-1918. Separate Report, 349:1-13, *16f*.
[30]Annals of Otology Rhisnology and Laryn, *24*:287-302. See also Goodale. J. L.. Pollentheraphy in the same journal, *24*:269-285.
[31]Forcheimers Therapensis of Internal Diseases. Edited by F. Billings and Ernest E. Irons, 1914.
[32]Discussed by T. W. Manning, in the Journal of American Medical Association, 64:655-657.
[33]Boston Medical and Surgical Journal, *175*:201.
[34]Journal of American Medical Association, *1916*:318. Abstract from American Journal of Pharmacy, *88*:573.

Queries and Answers

QUERY No. 331—Of what use is formalin when given internally and what is the dose? C. M. H.

REPLY—Formalin has been used as an internal medicament in many different conditions, but its more rational use is limited to its employment as an antiferment in digestive disturbances and in mammitis. The dose in digestive disturbance in the horse varies with different existing conditions and is from one to four drams, given in oil or whole milk, preferably in a capsule.

Formalin is given to cattle suffering with mastitis in the same manner that it is administered to the horse and may be given in ounce doses. On page 642 of the September issue of the AMERICAN JOURNAL OF VETERINARY MEDICINE, in a report of the proceedings of the meeting of the American Veterinary Medical Association, you will see a discussion of mastitis in cattle given and mention of the use of formalin in such cases.

QUERY No. 332—Some time ago I read the description of an operation for scrotal hernia in the pig in your JOURNAL. Will you please describe the method of treatment of a similar condition in sows? C. M. H.

REPLY BY DR. J. V. LACROIX—Hernias simulating the inguinal type, that are to be observed in the male subject, are rare in the female. When they do occur they are usually perineal hernias. Crural hernias are possible in the sow, as in the female dog, but I have never observed a case.

The treatment of perineal hernia is always an unsatisfactory proposition. In such cases, because of the nature of the structures involved, it is practically impossible to reduce permanently such visceral displacements. The difference between perineal hernia in sows and inguinal and scrotal hernias that occur in the male porcine subjects is that the displaced viscera in the former instance is pushed backward by way of the pelvic portion of the peritoneal cavity alongside the fixed part of the rectum and the resultant tumor-like mass occupies a position above the pubis. In inguinal hernias the displaced viscera make their way out alongside the spermatic cord and if the hernia is not interstitial, the viscera remain enclosed within the vaginal sheath and of course are situated below the pubis.

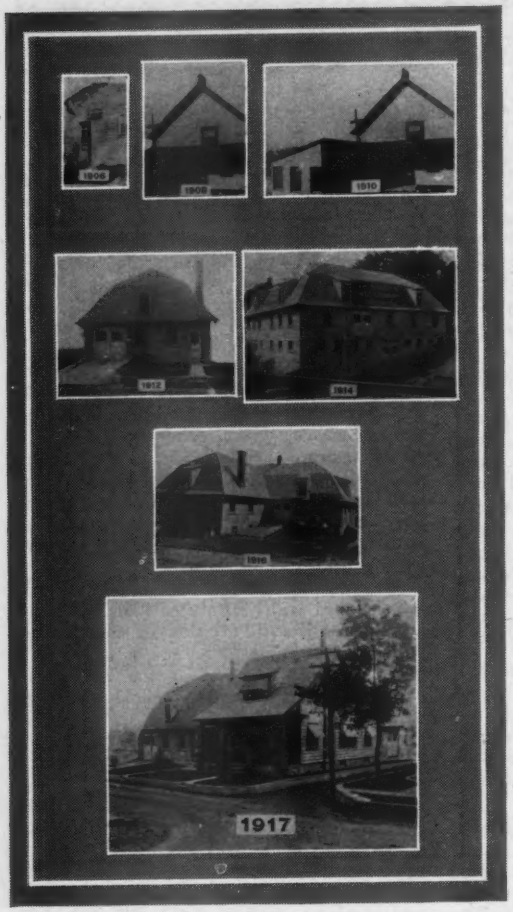
QUERY No. 333—Please describe the technic of operation for the correction of umbilical hernia in swine. C. M. H.

REPLY BY DR. J. V. LACROIX—Umbilical hernias in fat swine are more difficult to treat than umbilical hernias of foals. This condition is best treated by withholding diet for twenty-four hours and then the subject is given a rectal injection of chloral hydrate about twenty or thirty minutes before operating. One to one and a half drams of chloral hydrate for each hundred pounds weight is the proper dose. It is best given by means of a dose syringe having a long, blunt nozzle, that may be gently introduced into the rectum for a distance of six inches or more. The chloral hydrate should be dissolved in twelve parts of tepid water and the animal's hind parts kept in an elevated position immediately after the injection has been made. This is easily accomplished by confining the subject upon an inclined table.

After having cleansed the operative area, it is painted with tincture of iodin. The operation consists in excision of the pouched skin and abdominal fat by means of an elliptical incision, reduction of the hernia and careful suturing of the abdominal wall. The peritoneum should be joined with chromic gut, employing a continuous suture. The abdominal muscles are likewise joined by means of another continuous suture, also of gut. Finally, the skin is closed with a heavy silk or linen thread and the wound margins are sealed with flexible collodion. Sometimes, in operating on male subjects, the end of the external prepuce is situated so as to necessitate making a portion of the skin incision at a point not directly over the hernia. However, this is of no serious consequence and only serves to make the operation a little more difficult.

After-care consists in keeping the subject in clean quarters for a week. Where a good technic has been employed, complete recovery should result. However, these cases are not ordinarily treated, it being only the valuable animals that receive such attention as a rule; consequently, this operation has not been frequently performed in the past.

QUERY No. 334—I notice mention made of the use of salvarsan in the treatment of the pectoral form of influenza in horses in Captain Gregg's article in the August number of the JOURNAL. Can you give me instructions regarding its use and also the cost of this preparation at present?



TEN YEARS' DEVELOPMENT OF A VETERINARY HOSPITAL.

The above shows the various buildings erected and occupied by Dr. Frank J. Baker, Gouverneur, N. Y.

REPLY: In the work, "Epizootics and Their Control During War," Miessner says:

According to its chemical composition salvarsan is a dioxydiamidoarsenobenzoldichlorhydrate, which is a yellow powder soluble in a strongly acid water. Air easily affects it, and it is changed when acid substances come in contact with it, which change, when the composition is examined either as to color or solubility, can not be detected and can only be determined by means of animal experiments. Therefore, salvarsan is packed in glass ampules which are filled with gas that does not influence it chemically and in this way protected against oxidation. In the event that ampules are damaged during transportation, they should not be used, nor should left over portions of previously employed preparations be used. For this reason it is not safe to prepare a solution for a considerable length of time before it is to be used. It can only be used intravenously because the salvarsan causes considerable necrosis in the skin and muscles.

Rips was the first to use salvarsan according to Ehrlich's directions. In order to make a solution of one gram, three drops of normal sodium hydroxid and 500 c.c. sterilized physiological salt solution are used. Therefore, 1,500 c.c. of this fluid had to be used when using three grams of salvarsan—the quantity for one treatment. For the injection Rips used a specially designed infusion apparatus, which consisted of a 500 c.c. glass cylinder, to the lower end of which a rubber tube with a cannula was attached. The solution is injected intravenously. No serious results were observed in the patients at any time, with the exception of transitory symptoms of restlessness.

The difficulties connected with the injection of such large quantities of fluid, caused Miessner to inject the salvarsan in concentrated form. In these experiments it was proved that concentrated solutions (one gram to 30 cc. fluid) were also well withstood when the solution was made sufficiently alkaline. If this instruction is not observed, fatal complications may result, since, according to Miessner, acid solutions of salvaran cause coagulation of the blood and may produce thrombosis in the lungs, which would cause early death of the animal. The use of concentrated alkaline solutions did not result in prolonged restless symptoms.

The price charged for salvarsan has fluctuated considerably for some time and we advise you to get quotations from your veterinary supply house. The discovery of a new arsenical compound possessing a number of advantages over salvarsan has recently been announced in the medical press. It is comparatively inexpensive.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the vrterinary profession and the lasting gratitude of those who are aided by your suggestions.

The Use of Concentrated Lye in Fistulous Withers

AT THE instance of Dr. J. V. Lacroix, I investigated the "Snider" method of treating fistulous withers Since the first of May I have treated twenty cases, but before beginning the treatment of fistula in this manner, I visited the British Remount Station where Dr. J. H. Snider was located and examined the cases, observed his methods of handling them and assisted in the work.

The technic that I employ is about the same as that of Dr. Snider and briefly it is as follows: The sides of the withers are thoroughly annointed with vaseline; in fact vaseline is applied in such a manner that it may be retained by the hair in a heavy layer. This protective coating in applied on both sides of the withers, covering also the caput muscles and the region of the elbow. This must be carefully done to prevent discharges irritating the skin. An incision is now made in the uppermost portion of the withers, sufficiently large to explore the fistulous tracts, and all pus and necrotic material is removed. The fistulous tracts are explored by probing and all is in readines to introduce the concentrated lye. For introducing the lye I employ an ounce syringe of hard rubber, after having removed its nozzle, including the end of the barrel. Lubricating the syringe with vaseline prevents its becoming damaged by the action of the lye with which the syringe is filled, and then the contents are readily deposited into the depths of the fistulous tracts. I employ about two-thirds of an ounce syringeful of lye for the average case.

Immediately after the introduction of the lye, I have an attendant watch the subject for about thirty minutes, to prevent it from removing any of the vaseline by rubbing against stall partitions or other objects. During the first fifteen or twenty minutes after the caustic has been introduced, the subject manifests evidence of irritation, but this subsides in every instance before the lapse of a half hour. It is quite apparent that the pain occasioned in this manner is not great, and such distress may be prevented by giving an ounce or two of chloral hydrate twenty or thirty minutes before introducing the lye. The lye begins to dissolve in about two minutes after having been introduced and all reaction has been completed within ten or fifteen minutes in such instances. The resultant pain is, in my opinion, not so great as where cases are treated surgically.

Reactionary swelling following this form of treatment is about the same as in the average case that is treated surgically, and lasts four or five days. The character of this swelling, where concentrated lye is introduced, is such as to encourage prompt resolution. Healthful granulations are promptly stimulated and wounds maintain a healthful condition after having been so treated. The subjects do not seem to suffer the least inconvenience within a few hours after the first treatment and there is no attempt in the average case on the part of the animal to rub or roll, or otherwise manifest evidence of irritation.

The only after-care required in these

cases is to remove detritus in the course of about a week; in some cases this is not really necessary. It is surprising to note the small amount of wound discharge in these cases. There seems to be an intensive hyperemia of the parts in cases treated in this manner, and as far as my observation has gone in the animals handled in this way in my practice, I consider it the best method of treatment that one may employ for the cure of fistulous withers.

I have not treated poll evil by this method, as for it I prefer to do the radical operation. However, there is no reason why it should not prove equally successful in fistula of the poll. But one should be careful to make the incision for introducing the lye at a point sufficiently posterior to the nuchal crest to prevent wound discharge coursing down over the face, with possible injury to the eyes.

G. F. JUNGERMAN, D. V. S.

Hiawatha, Kans.

"PITFALLS" IN THE TREATMENT OF STERILITY

I have found this one of the greatest drawbacks to the work [treatment of contagious abortion and sterility of cows], in which I am engaged. A man watches me at my work for an hour or two, and concludes that he has learned all that I have gained during twelve or fifteen years of conscientious study and investigation. Some veterinarians who have watched me for three or four hours have advertised that they have taken a special course under me, have inferentially learned all that I know and made some highly important advances. Among their first accomplishments, is the killing of a number of highly valuable cows, by rupturing the cervix or uterus; the aborting of cows which were safely pregnant (except they fall in the path of the embryonic specialist in sterility); or sending to the butcher as incurably sterile, cows four to seven months pregnant. As a result, the work I am striving to accomplish is brought into disrepute, and the wildcat veterinarian disgraces himself and the profession.

There is no more important field open to the veterinarian, and there is no field which calls for more conscientious, careful, and constant study. The field does not lend itself to charlatanism, as boring for "hollow horn," slitting the tail for "wolf in the tail," injecting abortion bacterins for controlling abortion, or drawing "wolf teeth" for curing ophthalmia. The charlatan runs a short race, and is soon stopped by his own malpractice. It is an extremely dangerous field for the charlatan, the ignorant and careless veterinarian, the veterinarian who is in a hurry, and the inherent fool. These quickly destroy themselves. On the other hand, any conscientious, careful and reasonably skilled veterinarian may by conscientious study and work fit himself to render a highly important service to cattle breeders and dairymen and, by conserving their interests, render a notable service to the state.—W. L. Williams in the *Jour. Amer. Vet. Med. Ass'n.*

The common error is to imagine that we possess unlimited powers in favorably influencing the healing of wounds, while in reality success depends on recognizing the natural means of repair, and in adopting measures which are likely to assist the *vis medicatrix naturæ*. —E. W. HOARE, *F. R. C. V. S.*

HEMORRHAGIC SEPTICEMIA IN IOWA*

The nature of hemorrhagic septicemia this year, unlike that of former years, is of the wild fire type, as someone has appropriately spoken of it. Up until this fall, most of the outbreaks we had occasion to observe where we had any occasion to work, were of the sub-acute, acute or chronic type, but very few of the outbreaks occurring since September have been of that type—they have mostly been highly acute. The disease is much more widely spread this year than heretofore. We have had reports from more parts of the state, from South Dakota, Nebraska, and as far as the river on the east. The mortality is much higher than we have observed it before, the number of animals lost being three, four or five times as great as were the losses in herds during preceding out-

* Discussion at Annual Meeting, Iowa Veterinary Medical Association, Ames, January, 1917.

breaks. It is not unusual to have a loss of fifteen and twenty animals in a single herd in one night. Our former experience was that it was the young animals that were lost, but the outbreak extends this year not only to young, but to old cattle. The loss was heaviest in pregnant heifers.

The outbreak this fall is indicative of soil borne infection. Most of the outbreaks have occurred in green corn, among corn stalks, and a good percentage of these are grown on soil newly broken, either the first crop or the first crop after some other grain. I have had a report of fifty-five affected herds, and of these fifty-one occurred in stalk fields, and nineteen on new soil. Our observation is that the infection is most likely to occur not when the cattle first start into the stalks, but after they have been in a while and have the corn pretty well cleaned up.

I want to emphasize the necessity of differential diagnosis. There are a number of diseases confused with hemorrhagic septicemia, among which is corn stalk disease. I am inclined to think there is no such thing as corn stalk disease. It is hemorrhagic septicemia in practically all cases. It is also confused with blackleg. We have on record six outbreaks in which we know that blackleg and hemorrhagic septicemia existed at the same time and in some of these treatment for blackleg and hemorrhagic septicemia was given at the same time. Malignant edema is confused with the disease, as is also anthrax. We find in hemorrhagic septicemia the spleens are enlarged, pulpy and soft, which might mislead us to suspect anthrax. In some of these cases that we have had occasion to examine and look into carefully, the condition has been diagnosed corn stalk disease or forage poisoning because the autopsies that were held did not disclose any lesions, but in every one of these we have found animals that give good evidence of lesions. Occasionally we find animals showing slight changes or no changes, but that is rare, and we frequently find the organism is hard to demonstrate by microscopic examination of the blood or fluid from it, but inoculation of rabbits usually tells whether it is hemorrhagic septicemia or not. We rely pretty largely on animal inoculation for our diagnosis of hemorrhagic septicemia.

The causative factor, the Bacillus bovisepticus, is an erratic organism. It may show a high virulence, and that virulence may decrease, but it may be brought back again.

CHAS. MURRAY, D. V. M.
Ames, Iowa.

SUCCESSFUL AMPUTATION OF COW'S LEG

On Sept. 24, 1916, I was called to a place four miles from town to see a cow with a broken leg.

I found on arriving, a cow with transverse fracture of the right metacarpal, about the middle third. The skin was cut about three parts of the way around and the bone was sticking out and was covered with mud.

I removed about three inches more of

the bone and dressed it up to the best of my ability. The cow raised her calf and was sold for beef last month. She got around well and used the stump to get up with. You will notice the shoulder has dropped some.

W. J. MOON, V. S.
Vermilion, Alberta, Canada.

DIFFICULTIES OF MEDICATION IN IMPACTION OF THE RUMEN

In reference to the article on atony and impaction of the rumen in cows in the October issue of VETERINARY MEDICINE, I should like to ask Dr. Frank S. Carr how he keeps the barium chlorid and tartar emetic in aqueous solution from going into the omasum, abomasum and reticulum, when he admits that of oil and saline cathartics and water a cow drinks very little goes to the rumen. How does the doctor get the action of the drugs he prescribes for atony in impaction of the rumen when he admits that all liquids go everywhere else but into the rumen?

I don't believe in saline cathartics or oil in this condition, and I agree with Dr. Carr that they do not reach the seat of trouble when given by the mouth; but I do not agree with him when he says that the agents he gives in aqueous solution will reach the seat of trouble while the other agents do not.

A. H. KRAUS, D. V. M.

Ellsworth, Kans.

SHEEP PRACTICE IN WESTERN NEBRASKA

In order to keep pace with industry which is rapidly undergoing reorganization, it behooves us, as veterinarians, to become equipped with more knowledge, that we may be in a position to render the greatest service to humanity, particularly at this time. This we can best do by acquiring a more extensive knowledge of the diseases of all our meat producing animals.

Located, as I am, in a large irrigated district where intensive farming is the accepted method, and motor power is rapidly advancing and taking the places of horses, I find that veterinary practice is making radical changes in its nature. I have nothing sensational to offer in the way of comment or advice, but a few remarks concerning adaptation to changing conditions which the veterinarian unavoidably must experience, may not be amiss.

In many localities, because of increase in the number of veterinarians, the scope of territory covered by each individual in making calls has diminished considerably. If in such instances these practitioners have not kept pace with the times and interested themselves in sanitary science and hygiene and preventive medicine in all its phases, they have experienced a marked diminution in their income from practice and their clients have not benefited

Driving a band of 3,000 sheep to market, Northern California. Photo by I. C. Brenner.

from the services of such practitioners in the measure that was due them. On the other hand, veterinarians who have been alert and progressive, taking advantage of all means that scientific progress has made available, enjoy material compensation in the way of fees earned in their work, to say nothing of the satisfaction derived in the performance of useful service in their respective communities.

In this community veterinary practice at the present time consists largely of work which the average veterinarian has not been trained especially to do, if, during his college days he centered his attention upon equine diseases and all that concerns the horse. There are

fattened on grain and alfalfa hay and the by-products of beet sugar factories, approximately 12,000 cattle and 150,000 sheep annually at this place. Animals for feeding are purchased at Denver and directly from the breeding grounds of the southwestern and northwestern states. The sheep that are fattened here are for the most part lambs and these are taken directly from their mothers, driven in large numbers, long distances, over dusty trails from the range to the railroad loading stations. These changes in the life habits of the sheep, together with the exposure to dust and exhaustion occasioned by transportation, predisposes to pulmonary affections of various kinds and to hemorrhagic septicemia.

In one instance in my practice, on October 15th, 1914, 1026 ewes and 300 lambs that were purchased in Wyoming, were driven forty miles over a dry and dusty road on a warm day. In a few days two animlas were sick and from one to three became sick each week until the month of January following, when about thirty were affected. The feed consisted of alfalfa hay, sugar beets and corn and the drinking water was obtained from a well. After five or six of this number died the owner described their symptoms as follows: There was a disturbance of respiration to the extent that some did not eat for a week; and "thumps"; others continued ruminating and did not appear sick, excepting that at the end of a week or so they had materially lost in flesh. In about two weeks respiratory disturbances subsided, but the sheep did not gain in flesh. I was called on Feruary 7th following, and had occasion to autopsy a number of these animals. The lesions were those if ordinary pneumonia and in those autopsied it was in the transitional stage from red to gray hepatization. All other organs were practically normal. The ewes only were thus affected, the lamps apparently having greater resistance.

After sheep have been shipped a considerable distance and unloaded, they will eat anything along the roadside while on their way to the feeding yards. As a result of the ingestion of poisonous plants and mouldy feed, great losses sometimes follow. In one instance 520 lambs loaded in Montana, fed in transit at Sheridan, Wyo., enroute four days, arrived here and were unloaded and driven one and a half miles to the feeding yards. This was October 6th, 1916. The yards where the sheep were taken had been

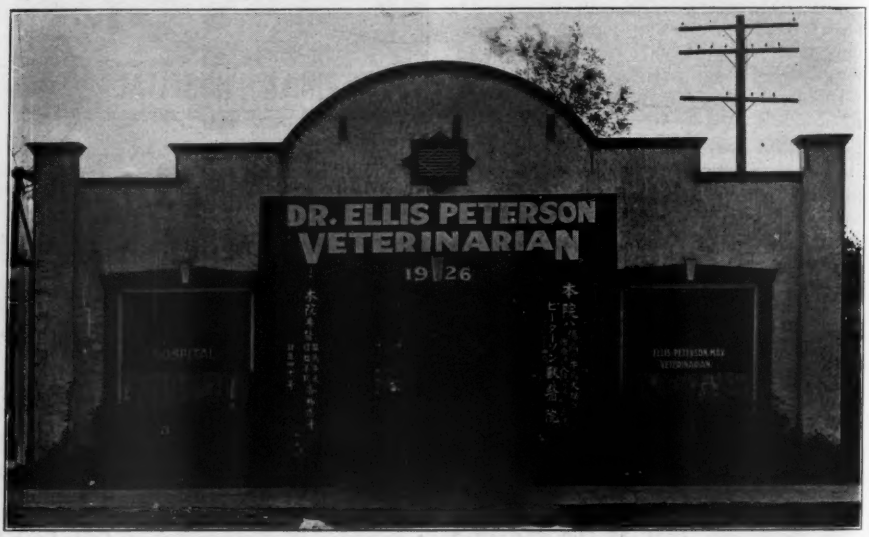
Hospital of Dr. Kragness, Redding, Calif. Dr. K. spends half his time in Chicago, the remainder in California. The photo shows Dr. Kragness (the taller one) and I. C. Brenner in the doorway.

bedded with old hay and straw taken from the roof of an old shed. Naturally it was mouldy and badly damaged, however, an abundance of first cutting alfalfa hay had been placed in the feeding racks, but the sheep ate of both feed and litter. They had been placed in these yards at 11 o'clock and by 5 o'clock of the same day one was dead and at 7 o'clock of this same day 25 had been lost. The owner stated that the affected animals manifested incoordination of movement; blindness; some falling over backwards; though, as he expressed it, "none were crazy."

Death resulted in such instances in from 10 to 30 minutes. On post mortem examination I found the stomach filled with the mouldy litter and naturally death was attributed to this cause. These sheep had access to fresh water and no deaths occurred until they had drunk a quantity of this water after having eaten of the mouldy litter. Undoubtedly the water ingested served to render the active agent more soluble and prompt absorption of the poisonous agent resulted. After the water supply had been shut off and all litter gathered up and burned, no new cases developed. Water was withheld for eighteen hours.

Very often southern lambs do not fare well if received at this station during inclement weather. This is particularly noticeable in such lambs as are affected in the least with necrobacillosis. On one occasion 3,500 lambs were brought here from New Mexico and not long afterward 300 lambs from Wyoming. These arrived during a protracted storm. Two weeks after the arrival of the New Mexico lambs, I was called to treat them for necrobacillosis and in these cases the death rate was running quite high. More than 30 had been lost the day previous to my visit. The Wyoming lambs during this period exhibited only the lip and leg lesions and no losses resulted.

Parasitism is a common cause of great losses of sheep here, as elsewhere. An instance where losses from this source occurred is somewhat unusual and perhaps worthy of mention. On November 22d, 1916, 1,075 southern Navajo sheep arrived and seemed to be in a good condition, nevertheless, a patent medicine man induced the owner to purchase his "Conditioner and Worm Destroyer." The owner began feeding this on January 1st and not long thereafter noticed that the animals were dieing occasionally. This loss gradually increased until January 18th at which time I was called. During the forty-eight hours previous to my visit, nine sheep had died. Others were sick. The sumptoms manifested were the following: A slight rise in temperature above normal; respiration forty-four, labored and abdominal; mucous membranes pale. The affected ani-



Hospital of Dr. Ellis Patterson, Sacramento, Calif.
Note the Japanese and Chinese veterinary signs. Dr. Patterson does much practice for persons of these nationalities.

mals held their heads to one side and in some cases even up over their backs.

Post mortem examination of some of these cases revealed the presence of an amazing number of Taenia fimbriata. These parasites were found in the small intestines, passing the eminence of Vater, entering the ductus communis and passing up the bile duct into the liver. Others entered the duct of

I. C. Brenner at the Oregon-California boundary line.

Wirsung and passed into the pancreas, even pushing aside the lobules of the pancreas. The ductus communis was dilated, reaching a dimension of three fourths of an inch and in several cases the bile was coagulated. One thousan eighty sheep of this same band, that had not been fed this nostrum, remained in good health, although no doubt they also were affected with taeniasis. Conclusions drawn led me to believe that the "Conditioner" had contained enough material that had sufficient taeniacide action to cause a loosening and migration of the taenia, consequently the treatment that I gave resulted satisfactorily. It consisted in the administration of the following agents: Magnesium sulphate, exsiccated ferric sulphate and sodium chlorid. This was given in estimated proportions, so that each sheep received about two ounces of the magnesium sulphate. The iron sulphate and sodium chloride were combined in proportions of about one of the former to ten of the latter.

H. C. Hughes, D. V. M.
Scottsbulf, Nebr.

CORN STALK DISEASE—HEMORRHAGIC SEPTICEMIA*

First of all, let me circumscribe my discussion and limit it to corn stalk disease in cattle and particularly the conditions that arise when cattle are turned into stalk fields after corn has been husked.

In investigating this disease in literature, we find it one of the oldest described diseases in this section of the country. The name is familiar to all. Those who are practicing are familiar with the disease. In my judgment, there are two forms. One is purely dietetic, the result of disturbances arising from poisonous chemic compound or some other changes which produce directly or indirectly digestive disturbances or perhaps toxemia. The other is the type of disease that we observe in which the animals manifest primarily nervous disturbances and especially disturbances of the brain or the meninges of the brain. In other words, it is a disturbance of the organs within the cranial field. This disease has been quite prevalent in some sections of the country during the last three, four, or five months and in some communities has taken heavy toll. One practitioner informed me that in his own community he was satisfied at least 200 cattle had died from it. Others have reported anywhere from ten to 100 deaths of cattle in their immediate vicinity and of their clientele. When a disease reaches that mag-

* Discussion at Semi-Annual Meeting of the Missouri Valley Veterinary Association, St. Joseph, Mo., February, 1917.

nitude, it is usually sufficient to create somewhat of a disturbance. The symptoms of this disease, I presume, are quite familiar to you all.

Usually the first animal, perhaps the first several animals, die without any symptoms having been observed. The animals are found dead by the owner. Should he see the symptoms, they consist of excitement, usually although not always, delirium, sometimes stupor, and in some instances there is a comatose condition. In some of those observed, there is a slight dilation of the pupil, and perhaps in one or two instances, there was a constriction of the pupil. The temperature usually remains normal, or in some instances where the outside temperature was low, zero or thereabouts, the temperature is even sub-normal, the pulse increased, respiration irregular and somewhat increased. The animals manifest cerebral disturbances in several ways, appear to become vicious; walk about as if blind, or if they see, do not pay any attention to what they see, run up against fences, against barns or fall into ditches, manifesting if they have their proper vision, that other conditions are so extreme that they do not appear to notice what is in their visual centers.

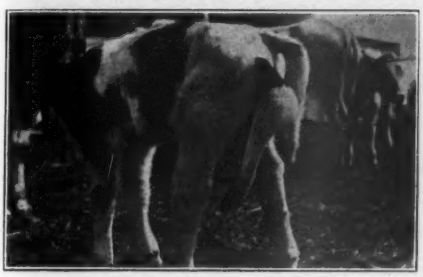
French Official.

Fistula, Marne District, France. Boy page Major Merillat.

In the autopsy of these animals, there are at least two things quite striking. First there will be found a hyperemia and in some instances an inflammation involving the periphery and sometimes the cerebral structure itself. Sometimes the animals have sufficient resistance that they live long enough so there is a marked accumulation of serous inflammatory fluid in the meninges, and besides that lesion invariably there will be found petechial hemorrhages in other structures of the body, more particularly perhaps between the epi- and endocardium. They are, I believe practically always present. In some instances hemorrhages are of greater magnitudes. In a few autopsies, similar small hemorrhages have been observed in the lung, and two or three instances of such hemorrhages have been observed in the kidneys, although they are not constant. In other cases some few hemorrhages will be found beneath the pleura and peritoneum, either visceral or parietal peritoneum. These are about the only lesions found, and the magnitude of these lesions and the extent of them seem to vary usually directly in proportion to the length of the time that the animal lives after the first symptoms are manifested.

Now as to what this condition is. It has been discussed for years. In bacteriological examinations in many of these cases, we have been able to find in enormous quantities a bipolar

staining organism that from all the various cultures, microscopical and inoculation tests, has proved to be the Bacillus bovisepticus. We appreciate the fact that this organism, the Bacillus bovisepticus, is universally distributed, that it is frequently found and in fact very commonly found as a secondary infection in a variety of diseased conditions. It is claimed to be possible to isolate this organism from the discharges of normal healthy animals. I do not question but that statement is correct. These organisms then being universally distributed, being found as secondary infections, it is sometimes a little difficult to say positively that they have been the specific cause of the condition in question. But gentlemen, when these organims are found in large numbers, particularly in the blood vessels or the blood of



Five-legged calf delivered by Dr. N. J. Miller, Johnstown, Colo.

the brain and the meninges and when these organisms when isolated and cultured will promptly kill rabbits, showing their pathogenic capacity, it seems to me that it is probable that they are a causative factor, at least in this particular type of the so-called corn stalk disease. You may accept it or if you wish you may reject it. If you reject it, it is I believe your duty to tell us as far as possible up to the present time what is the cause of this cerebral type of this disease.

Some of you will bring up questions relative to certain fields, and we do not dispute that animals in certain corn fields seem to be afflicted more intensely and in greater numbers than in others. This is not unusual. The same thing happens in blackleg, in tetanus, in malignant edema. The same thing happens in anthrax, so I do not see that that argument has any force. In fact, I have been told that certain laboratory men have isolated these organisms from the corn stalks in fields where this disease has been very prevalent and also that it is not difficult to demonstrate that these organisms were at least somewhat pathogenic.

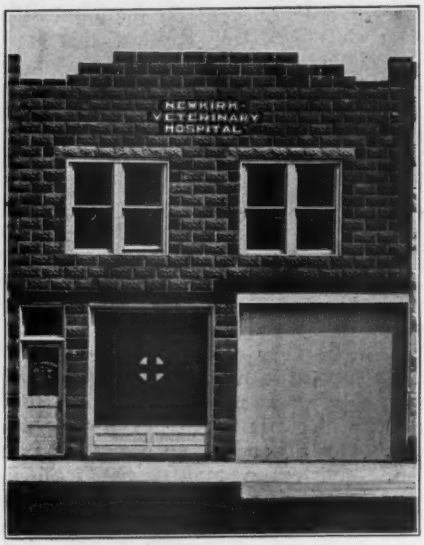
Kansas City. A. T. Kinsley.

Discussion

Dr. D. F. Luckey: If the impression was left by Dr. Kinsley that any great percentage of what we have heretofore called corn stalk disease such as forage poisoning is due to the germ of hemorrhagic septicemia, I do not think that impression ought to be too general. We might be led into a mistake. For instance, a bunch of cattle get into a sorghum patch and eat this forage, a lot of them die, specimens are sent to the laboratory for investigation, and the infection of hemorrhagic septicemia is found—it would be very dangerous to conclude that the cattle died from hemorrhagic septicemia. It might be possible that a herd of cattle might get into a stalk field and a good many die, and upon post mortem a man might send in lesions of tuberculosis and the bacillus of tuberculosis might be found, but it would not be correct to say that those cattle were killed by tuberculosis. We know we have a lot of forage poisoning and we also know that hemorrhagic septicemia infection is quite prevalent, and cattle dying of forage poisoning might also be infected with this germ.

I mentioned this at the Nebraska association meeting to show how a big blunder can be made on that score. We had a little bunch of sheep that became affected with forage poisoning, in which the symptoms were first a swelling of the ears; later the eyes became stuck up with a mucous discharge, and the nose likewise, causing them to breathe through the mouth.

These sheep died in quite large numbers in some cases. In one case 300 head died on forty acres of oat stubble where there was positively nothing else in the field for them to eat, and in one case the sheep were plainly suffering from mold poisoning. Specimens were sent for examaintion and germs of hemorrhagic septicemia were found. Just a few weeks later another shipment of western sheep went into a stubble field and the same thing happened, 316 sheep I believe, and the report came back that it was hemorrhagic septicemia. They sent for $44.00



Hospital of Dr. J. H. Jimmerson, Newkirk, Okla.

worth of hemorrhagic septicemia bacterin and gave to these sheep and they all died. The error was that the sheep were infected secondarily with hemorrhagic septicemia. When that was ascribed as the cause of death and the vaccination was a failure, it left a very bad impression on the owner.

The symptoms are very similar in many cases, and one should be guarded and not too positive and say, "We will vaccinate your cattle," and think that is all there is to it, because they might die and you would lose your reputation. Just be a little guarded in your conclusions, and while immunizing against hemorrhagic septicemia, also look out for a forage poisoning along with it.

I found in Nebraska they had been making a diagnosis and vaccinating for hemorrhagic septicemia, and the cattle go back to the stalk fields and die. As a consequence many veterinarians at that association were becoming very skeptical of vaccination for hemorrhagic septicemia. When properly used it is attended with magnificent results, but it will not prevent corn stalk disease or forage poisoning.

Dr. Kinsley: I think I covered every objection that Dr. Luckey presented. I made the statement that in the finding of these cases, in some instances there was insufficient evidence to detect hemorrhagic septicemia, but if we find myriads of these microbes in the blood and brain and they are virulent enough to kill rabbits, if they were not the cause of this trouble, I called on those who deny it to name the cause.

NOTES ON SORGHUM POISONING.

(*Continued from page* 858)

July 15, 1917.

2:10 p. m.—Fed horse No. 1 2½ pounds. Pulse 36.

3:00 p. m.—Fed horse No. 1 2 pounds more. Animal stopped eating suddenly, but ate a few more stalks when held in hand before him.

2:45 p. m.—Fed horse No. 2 2 pounds. Pulse 33.

7:30 p. m.—No symptoms had been shown and both horses were normal.

July 16, 1917.

The goat ate two pounds, with no ill effect.

Having had cases of poisoning from both partially cured and uncured sorghum in rapid succession, with some of the material still on hand, the writer thought it would be advisable to analyze material from both lots for prussic acid or precursers of prussic acid.

Mr. J. B. Overstreet, of the Department of Chemistry, Agricultural and Mechanical College of Texas, College Station, Texas, very kindly assisted the writer and prepared the following report of the work done:

Cyanogen Compounds in Andropogan Sorghum

"The poisonous effects of feeding sorghum to cattle (especially the second growth) has often been noted. The production of the poisonous compound is believed to be due to the decomposition of a glucoside (dhurrin) $C_{14}H_{17}NO_7$, which is either decomposed in the sorghum or by fermentation in the stomach of the animal.

"In the tests made, some of the material from the same lots which had been fed to cows with the production of all the symptoms of cyanide poisoning, was chopped fairly fine and digested in distilled water for twenty-four hours. Tests of the liquid was then made as follows:

"(1) A slight odor of bitter almond appeared to be noticeable.

"(2) Five drops of the solution acidified with one drop of 10 per cent HCl gave a Prussian blue (ferric ferrocyanide) when two drops of dilute ferrous sulfate and two drops of ferric chlorid were added.

"(3) A small amount of material, with the water contained over it, was subjected to distillation, and condensation by means of Liebig condenser,—the vaporous distillate being received in a flash containing silver nitrate solution. White silver cyanide, soluble in ammonium hydroxide and in sodium thiosulphate, was produced. The whole apparatus was then subjected to a thorough washing with distilled water and the washings tested until no reaction was obtained with silver nitrate. The distillation repeated gave the silver cyanide precipitate again.

"(4) A piece of filter paper impregnated with a solution containing three parts of gum guaiac in 150 parts of water, then moistened with a drop of copper sulphate (1 part to 500 parts water) gave the characteristic blue color, produced by cyanides. This test was performed by holding the test paper in the *vapor only*, from the partially fermented sorghum (part of the same material used in the distillation) and the coloration could not have been due to the impurities, such as iron, which might have been present in the solution."

From the results of the foregoing experiments, it would seem to be proved quite conclusively that poisoning can and does occur from feeding nearly cured immature sorghum. It would also seem that horses and goats were non-susceptible, or at least not very easily poisoned, for they ate exceedingly more than did the cows.

Further experiments are contemplated with dry sorghum, and also feeding green and dry sorghum to horses and sheep.

Since making the previous observations, the writer has had his attention called to the death of a cow at Beeville, Texas, from eating Shallu, or Egyptian Wheat, with all the symptoms of prussic acid poisoning. This Shallu was dry enough for the leaves to crumble, having been cut several days. This Shallu belongs to the sorghum family.

Very likely the exceedingly dry season has something to do with the poioning from this semi-dry material, more dhurrin seemingly being produced in sorghum in dry seasons than in wet seasons.

BOOKS OF 1917.

(*Continued from page* 868)

tion, inasmuch as even the most common infectious diseases have been successfully controlled among the horses of the armies.

With the entrance of our country into the war, our profession will have to perform a great task and no doubt everyone actively engaged in the service will do his utmost toward meriting recognition and thereby aiding the profession.

The veterinary literature on army service, as it relates to experiences in this war is rather meager, and therefore "Epizootics and Their Control During War" will be welcome to those who will seek eagerly, information to help them along in their new lines of duties.

The publication should prove of great value not only to army veterinarians, but also to the practitioner who desires to familiarize himself with the control of diseases discussed in the publication.

The diseases to which the animals of the fighting nations are exposed are treated by the author in a masterly fashion which include also the maladies which may be introduced as a result of invading and retreating armies. Glanders has received the greatest attention and the author has evidently recognized the importance of this disease and the necessity of army veterinarians to be fully informed with all of its phases. He describes in detail the etiology, pathogenesis, morbid anatomy, symptomatology and differential diagnosis and enters minutely into the various tests which are being now employed for diagnostic purposes. The agglutination, conglutination,

and complement fixation tests are described in detail. Likewise the ophthalmic test is given very close consideration. Measures for combating the disease are also fully discussed.

Of the other diseases, anthrax, rabies, mange, influenza, strangles, dourine, contagious pleuropneumonia of cattle, rinderpest, have also received due attention. The chapter on disinfection, while brief is up to date and is of special value to veterinarians in the army service.

The appendix by Dr. A. A. Leibold on "Hints on Handling War Horses in America" gives a splendid review of the literature and experience gained by others along these lines.

The thirty-seven illustrations add a great deal to the book and especially those on glanders are exceptionally good.

The publication should prove a very valuable aid not only to the veterinarians in the army service, but also to all live stock sanitarians who are engaged in the conservation of live stock and in the control of infectious diseases.—A. Eichhorn, in the *Jour. of the A. V. M. A.*

In an extended and very complimentary review of this work in *The Veterinary News,* London, the Editor, E. Wallis Hoare, F. R. C. V. S., says in part:

"It would be natural to expect that in reviewing a work of the kind we would seek with special interest for evidences of the incidence of epizootic diseases in Germany army horses, and also note the methods of prevention and treatment advised and adopted by German authorities.

"In both these directions much valuable information can be gained from a perusal of this book, and the translator has rendered a good service to the profession by placing within its reach the views and opinions of an author who must be regarded as a well known specialist in this sphere of work.

* * * * * *

"We have perused this book with great interest. and gained much information therefrom. We consider it a very valuable addition to veterinary literature and have no hesitation in saving that it will prove of marked value to both civilian and army veterinary surgeons."

A Text Book of General Bacteriology.

Edwin O. Jordan, Ph. D.

Professor of Bacteriology in the University of Chicago and in Rush Medical College. Pages 638; fully illustrated. Publisher, W. R. Saunders Co., Philadelphia, 1916.

Reviewed in the February, 1917, issue. Page 90.

Steadman's Medical Dictionary.

Thomas Lathrop Stedman, A. M., M. D.

Editor of the Twentieth Century Practice of Medicine. Publisher, Wm. Wood & Co., New York, 1917.

Reviewed in June, 1917, issue. Page 381.

A Text Book of the Principles and Practice of Veterinary Medicine.

David S. White, D. V. M.

Dean of the College and Professor of Veterinary Medicine in the Ohio State University, Columbus, Ohio. Pages 484. Publisher, Lea & Febiger, Philadelphia, 1917.

Reviewed in June, 1917, issue. Pages 381.

The Pathology and Differential Diagnosis of Infectious Diseases of Animals.

Veranus Alva Moore, B. S., M. D.

Professor of Comparative Pathology, Bacteriology and Meat Inspection, New York State Veterinary College, Cornell University, Ithaca, and Dean of the College. Pages 593; 120 illustrations. Publisher, The MacMillan Company, New York, 1916.

Reviewed in June, 1917, issue. Page 382.

Productive Dairying.

R. M. Washburn

Professor of Dairy Husbandry, University of Minnesota. Pages 432; 131 illustrations. Publisher, J. B. Lippincott Co., Philadelphia, 1917.

Reviewed in July, 1917, issue. Page 451.

Report of the Twentieth Annual Meeting of the United States Live Stock Sanitary Association.

Dr. S. H. Ward, Sec'y.

Pages 256. Published by Dr. S. H. Ward, St. Paul, Minn., 1917.

Reviewed in July, 1917, issue. Page 451.

Proceedings of the Ohio State Veterary Medical Association.

Dr F. A. Lambert, Sec'y.

Pages 160. Published by Dr. F. A. Lambert, 1917.

Reviewed in July, 1917, issue. Page 452.

Yearbook of the Department of Agriculture, 1916.

Secretary of Agriculture.

Pages 783; 260 illustrations. Publisher, United States Department of Agriculture, Washington, D. C., 1917.

Reviewed in July, 1917, issue. age 452.

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Frank Townsend Barton, M. R. C. V. S.

Pages 255. Publisher, The MacMillan Co., New York, 1917.

Reviewed in July, 1917, issue. Page 453.

Microbiology—A Test Book of Microorganisms, General and Applied.

Chas. E. Marshall

Professor of Microbiology and Director of Graduate School, Massachusetts Agricultural College, Amherst, Mass. Pages 900; 186 illustrations. Publishers, P. Blakiston's Son & Co., Philadelphia, 1917.

Reviewed in August, 1917, issue. Page 528.

Materia Medica and Therapeutics, Including Pharmacy and Pharmacology.

President of the American College of Physicians, etc. Pages 860. Publisher, P. Blakiston's Son & Co., hiladelphia, 1917.

Reviewed in September, 1917, issue. Page 648.

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Matters of Current Interest

Nearly eight per cent of the $600,000,000 worth of eggs marketed annually in the United States are lost through spoilage or breakage, says a Farmers' Bulletin of the United States Department of Agriculture, The Community Egg Circle, recently reprinted. Improper handling between the farm and the market, the bulletin declares, is responsible for a large part of the loss.

Dr. J. A. Donaghue has located for practice at Ritzville, Wash. Dr. Donaghue spent several weeks in Chicago recently taking a post graduate course at the Chicago Post Graduate College.

Dr. L. G. Watters, formerly of Red Creek, N. Y., has taken over the practice of Dr. F. J. Krenz, of El Paso, Ill. Dr. Krenz has located at Mendota, Ill.

A new organization of veterinarians composed of the practitioners of Hendricks, Putnam, Fountain, Montgomery and Boone counties, Indiana, has been effected. Dr. J. G. Heighway, of Ladoga, Ind., is president, and Dr. R. E. Niven, of Crawfordsville, Ind., is secretary. The association plans not only to give attention to veterinary matters but to exert its best efforts for an increase in the production of live stock during the war.

A new state law in California requires that all cows from which milk is sold in the state, shall be tuberculin tested. Testing is done without expense to the owners by deputy state veterinarians.

A rabid coyote entered a hog lot near Redmond, Oregon, recently and bit several animals, two of which have since died of rabies. Cows on the same farm have also died from rabies, supposedly from being bitten by the same coyote.

The live stock board of Utah met at Salt Lake City and adopted a resolution endorsing the campaign against predatory animals now being conducted by the state in co-operation with the Bureau of Biological Survey, United States Department of Agriculture, and urging Congress to appropriate $300,000 for the campaign against predatory animals in the Salt Lake City district.

Dr. James E. Ewers, inspector in the Bureau of Animal Industry, assigned to dourine eradication work in the northwest, received a broken arm while engaged in his work, and has been transferred to the stock yards at Sioux Falls, S. Dak.

Mrs. Kate Brownback has sued Dr. Chas. E. Brownback, of 320 S. 4th street, Springfield, Ill., for a divorce, and asks alimony.

PRESERVING THE SEED STOCK

After this war the United States will be in possession of an invaluable asset, the major part of the world's seed stock, cattle, hogs and sheep. The International Live Stock Exposition is the principal agency in this process of preservation and accumulation which will put North America in an enviable position.

The seed stock of Germany, Belgium, France and other European countries has been depleted to the extent of extermination. Great Britain is faced with the prospect of slaughtering pure-bred flocks and herds if the war continues, and lack of feed may force Holland and Denmark to adopt a similar policy this winter.

The pick of this seed stock of the equine, bovine, porcine and ovine species will be exhibited at the International Live Stock Exposition the first week of December. It will be a display of superlative merit, possible nowhere else on this mundane sphere under present or post-bellum conditions. Those who miss it will have neglected an opportunity.

The civilized world must have a supply of animal foods and in the present emergency; providing it is the task of the United States. Under normal conditions the 1917 International Live Stock Exposition would have had a vastly greater economic value than its predecessors; with the certainty of semi-famine conditions for years to come, the institution has assumed greater importance than ever.

AN ERA OF PROSPERITY

At the close of the world war, now in progress in Europe, the live stock business of the United States will face its greatest era of prosperity. The reason for this is evident, for before agriculture activities can be renewed on the devastated farms of war-ridden Europe, those farms must be re-stocked with horses and all kinds of breeding stock which the ravages of the war have so materially reduced in numbers.

Where will Europe go to supply this demand for horses, cattle, swine and sheep? Who can supply these units so necessary for profitable agriculture? America, and America only. And, to meet this unprecedented demand for breeding stock, it behooves the American live stock farmer to begin at once his preparations to have his stock in shape to stand inspection of foreign buyers who will scour this country when Europe lays aside the sword to take hold of the plow handles once more.

During the first week of December, there will be held at Chicago, Illinois, the largest exhibition of horses, cattle, swine, and sheep in this country, and possibly the largest in the whole world. It is the International Live Stock Exposition, where more than 4,500 pure-bred and fat animals, foremost representatives of all the well known breeds of horses, cattle, swine and sheep, will be viewed by the judges in competition for a fortune in prizes.

Even if you are not a breeder of live stock, the International is well worth visiting. It affords an opportunity to get away from home, see some of the world outside, and become acquainted with your distant neighbors. See what the other fellow is doing to make this a better world, and incidentally pick up some pointers on animal breeding, which are bound to be circulating where so many experts are gathered. Take your wife, daughters and sons along, make it a vacation trip for the whole family, for you will find entertainment for all at this show. Reduced railroad fare will be in effect from all points to Chicago.

Anthrax is reported to have appeared in two widely separated ranges in the vicinity of Gardnerville, Nevada.

A marriage license was granted to Dr. Charles F. Sheets, a veterinary surgeon of Flora, Ind., and Miss Emma Smith, daughter of James A. Smith, of Madison, Ind.

Dr. Winfred B. Mack of the University of Nevada, at Reno, has announced a diagnosis of anthrax from specimens sent him from Carson City.

The annual losses from hog cholera and cattle tick were estimated by the United States Department of Agriculture to exceed $60,000,000. A more extensive fight than has ever before been waged against these diseases will be carried on by the Agricultural Department during the coming year.

More than 1,000 hogs were reported to have died in Moville, Iowa, from necrobacillosis. Dr. J. B. Hollenbeck, a representative of the Bureau of Animal Industry, says that more hogs have died of necrotic enteritis (necrobacillosis) in northwestern Iowa during this year, than have died of cholera.

Over 4,500,000 horses and mules are said to have been employed by the various combatants in the present world war. It is predicted that the American army will ultimately need 1,000,000 horses and mules.

The American Red Star Animal Relief, Albany, N. Y., is appealing to the public for subscriptions to the amount of $250,000, for the care and treatment of American military horses and mules. It is stated that the work in France, similar to that which the Red Star proposes to do, has saved the British government $30,000,000 in horse flesh and greatly increased the efficiency of the army.

Dr. C. E. Wickton, Princeton, Minn., has accepted a temporary appointment to the position of veterinary inspector, with orders to report to the local office of the Bureau of Animal Industry, South St. Joseph, Mo.

Capt. Olaf Schwarzkopf, having completed twenty years' service as army veterinarian, has been granted the rank, pay and allowances of major, from Sept. 14, 1917.

Dr. L. B. Woodward, formerly of Dodge City, Kans., has located for practice at Brighton, Colo.

An examination of approximately two hundred dairy cows by F. C. Williams, Red Cross dairy inspector, working under the direction of the United States public health service, showed but six afflicted with tuberculosis.

A disease diagnosed as rabies by Dr. A. W. Hoggan, state live stock inspector, has appeared near Modena, Utah, the history of the case being that a coyote was discovered killing a pup on this farm September 10th. The coyote was shot and ten days later a calf died exhibiting the symptoms of rabies and since that time about twenty other animals in the herd of cattle have died under the same conditions.

Dr. K. W. Stouder of the Veterinary Extension Department of the State College, is devoting most of his time to lectures in different parts of the state on the subject of hog cholera. Films are shown demonstrating the origin and progress of the disease.

Hog cholera is reported to be unusually prevalent in Logan County, Kansas.

Members of the junior class of the college of veterinary medicine of the George Washington University, celebrated their annual banquet at the Corchran Hotel, Oct. 30.

Dr. E. A. Buxton of Vinton, Iowa, has been reappointed assistant state veterinarian for a term of three years by Gov. Harding.

The Illmo Veterinary Medical Association

met in East St. Louis October 31st. The following officers were elected for the ensuing year: President, Dr. J. T. Jenneman, St. Louis; vice-presidents, Drs. T. J. Menistrina, E. St. Louis, O. K. Faires, Trenton, Ill.; secretary, Dr. L. R. McKinley, Freeburg, Ill.; treasurer, Dr. Robert Bushman, Marissa, Ill.

Dr. L. H. Mathers reports something like thirty cases of influenza in cattle in the vicinity of Sebastopol, Cal.

Forage poisoning has been reported as prevalent among horses running in low land pastures about Marland, Iowa.

Not How Fast but How Well

The Macon City (Ill.) *Banner* reports that Dr. O. E. Blair, of Chandlerville, recently vaccinated two hundred and twenty-five hogs in one hour and thirty-six minutes, and three hundred and seventy hogs in two hours and thirty-five minutes.

Dr. Grau, veterinary inspector in charge of the hog cholera prevention work in Nemaha and Richardson counties, Nebraska, reports that while there is some improvement in hog cholera situation, there is still much work to do in both of these counties. Dr. Hurst, in charge of the hog cholera eradication work in Johnson County, declares that that county faces a meat shortage because of the prevalence of hog cholera.

Mr. C. C. Stinson, county demonstration agent for Jefferson County, Okla., reports the loss of a great many cattle from corn stalk disease, and states that blackleg is unusually prevalent in his territory.

Hemorrhagic Septicemia is reported as being prevalent in the vicinity of Madrid, Iowa. The disease is said to be controlled by the use of bacterins.

The Sioux Valley Serum Company of Sioux City, Iowa, has changed its name to the American Serum Company and has undertaken the manufacture and sale of a general line of biologics. The officers of the new company are Dr. T. B. Huff, president; G. A. Drinkard, secretary.

The case of anthrax in a dog that had eaten of the carcasses of animals dead of anthrax is reported at Gridley, Cal. Dr. S. A. Freeman promptly administered anthrax serum and the dog quickly recovered.

Blackleg

Extensive outbreaks of blackleg have been reported in Oregon, Idaho, Utah, Texas, Nebraska and Missouri.

Owing to the unusual prevalence of blackleg this season, a proclamation was issued by the state live stock board of Utah ordering that all cattle in the state between the ages of three months and two years be vaccinated for the prevention of blackleg.

The governor of Idaho issued a proclamation ordering the vaccination of all cattle between Oct. 1 and Dec. 1. Much objection was raised to this latter proclamation because it required the vaccinating of adult cattle, in general not susceptible to blackleg.

Dr. D. F. Luckey, state veterinarian of Missouri, has announced that he has for free distribution blackleg vaccine, produced by the United States Department of Agriculture. The vaccine may be obtained from his office at Jefferson City.

In some counties in Nebraska farmers have organized for the purchase of blackleg serum, the purchase being made through the county agent.

Dr. Fred E. Schultze, fifty-nine years old, formerly a well known veterinarian of Brooklyn, died recently on his plantation on Little River, near Miami, Fla.

Dr. C. C. Lipp, veterinarian in the South Dakota Agricultural Experiment Station, cautions the farmers of South Dakota against feeding calves from dirty pails, claiming that this practice is the usual cause of scours, the greatest source of loss among calves.

Dr. J. M. Nelson of Sigourney, Iowa, has been appointed deputy state veterinarian by Gov. Harding for a term of three years.

It is reported that Dr. L. E. Campbell of Pine Bluff, Ark., has successfully amputated a cow's leg and has fitted thereto a nice willow leg, which is being satisfactorily operated.

Dr. F. C. Frye, Letta, Iowa, has recently been given a temporary appointment as state inspector, with instructions to report at the local office of the Bureau of Animal Industry, South St. Joseph, Mo.

Dr. G. F. Korinek, Stayton, Oregon, was recently injured in an automobile accident. The doctor's car is said to have turned over three times. The doctor, covered with oil and gasoline, was pulled from beneath the wreckage.

SAVE THE SOWS

Selling a brood sow at this time, according to the United States Department of Agriculture, is like killing the goose that laid the golden eggs.

When pork is selling at 18 cents or more a pound on the hoof, the hog breeder may be tempted to turn into cash all that he can sell; yet the department points out that the value of a brood sow which will produce such high-priced offspring is proportionately increased and she should be kept as the source of further and future profits.

Since the beginning of the war the number of swine in all countries has decreased, and the decrease has been marked in some of the belligerent countries. In France, for example, in the three years just before January 1, 1917, the number of swine decreased 38.12 per cent; during 1915 the number in Germany decreased 31.47 per cent.

THE BEST USE FOR SKIM MILK

All skim milk should be used—none wasted. It should furnish the maximum of food to human beings and does this better when used direct, as cottage cheese, prepared buttermilk, or other by-products, than when fed to animals and converted into meat. Surplus skim milk may be used economically to feed hogs, yet 100 pounds of it, which will produce 15 pounds of cheese, produce only 4.8 pounds of dressed pork if fed with corn. Skim milk if made into cottage cheese furnishes nearly seven times as much protein and nearly as much energy as the dressed pork it would produce. Of course the most nourishment is obtained when skim milk is used direct, either for drinking or cooking. As far as possible, therefore, skim milk should be used for human food and only the excess fed to live stock.

Buttermilk is equal to skim milk for feeding hogs, while whey is half as valuable. Whey, being low in protein, is not well suited for young pigs and should be fed to older animals.

Veterinarian's Case Record at Half Price While They Last

The blanks in this book are printed on good bond paper. They are conveniently arranged for keeping a record of all sorts of cases. Provision is made for 154 case reports. The supply is limited. Formerly sold at $2.00.

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9 South Clinton Street Chicago, Illinois

Dr. J. S. Hollingsworth, of Green Bay, Wis., said to have been the oldest veterinarian in Wisconsin, died of heart disease November 2. He has been in active practice in Green Bay since 1872, and was 72 years of age at the time of his death.

Dr. Phil E. White has removed from Leeds, N. D., to Paxton, Ill.

Dr. J. F. O'Keefe, of Farley, Ia., has accepted the position of inspector of contagious diseases among cattle and hogs, with the Bureau of Animal Industry, with headquarters at Des Moines.

Fifteen dollars' worth of instruments belonging to Dr. Chas. Gruber was stolen from his car while parked in front of his office in Ft. Wayne, Ind.

A great prevalence of corn stalk disease is reported in the vicinity of Oscaloosa, Ia. Many of the cases assume the form of so-called "mad itch." The use of hemorrhagic septicemia bacterins is reported as being a successful preventive.

Second Lieut. K. B. Buffin, of the Veterinary Officers' Reserve Corps, has been relieved from army transport service in New York and ordered to Washington for duty with the Twentieth Engineers.

Dr. C. A. Cary, state veterinarian of Alabama, has notified objectors to the cattle dipping law, that resistance to this law will be useless. That the law will be enforced impartially and with the greatest firmness in order that Alabama will be tick free at an early date and the cattle of the state relieved from quarantine restrictions.

SODA LYE NO REMEDY FOR HOG WORMS

Soda lye has no value as a remedy for or preventive against worms infesting hogs, nor is it likely to be of value against similar intestinal parasites in other animals, according to the United States Department of Agriculture.

Hogs were fed daily with the soda lye mixed in their food in accordance with the directions printed on the label of the sample tested. As a result, it was found that the hogs remained infested throughout the period of treatment—2½ months—and that the extent of infestation was increased rather than decreased.

The Medicinal Treatment of Parasitic Diseases—An Undeveloped Field of Veterinary Medicine, by Maurice C. Hall, Parasitologist, Research Department, Parke, Davis & Co., Detroit.

A Word on Anti-Hog Cholera Serum

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HIGHER SALARIES FOR VETERINARY INSPECTORS

The Secretary of Agriculture has approved of the following arrangements of salaries in the positions of lay inspector (grade 1) and veterinary inspector, to become effective November 1, 1917, and necessary papers will issue on the earliest date possible carrying this plan into effect on that date:

All lay inspectors (grade 1) now serving at $840 per annum will be promoted to $960 per annum. At the new salary it is understood that those who were appointed previous to July 1, 1917, will be entitled to the ten per cent increase provided by Congress.

All lay inspectors (grade 1) now receiving $900 per annum plus ten per cent will be promoted to $960 and it is understood that at their new salary they will be entitled to the ten per cent increase provided by Congress.

The initial salary in the position of lay inspector (grade 1) will be made $960 per annum, which will not carry the ten per cent increase.

Veterinary inspectors now receiving $1,400 per annum will be promoted to $1,500 per annum and it is understood that those who entered the service previous to July 1, 1917, will be entitled to the five per cent increase provided by Congress, while those who were appointed subsequent to June 30, 1917, will not be entitled to the five per cent increase.

The initial salary in the position of veterinary inspector will be $1,500 per annum, which will not carry the five per cent increase.

A. D. MELVIN,
Chief of Bureau.

The Sterility of Cows
Its Cause and Treatment
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English translation by
Dr. H. Wehrbein
Late specialist for Infectious Abortion Investigations, U. S. Bureau of Animal Industry
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9 South Clinton St., Chicago, Ill.

A NEW EXAMINING BOARD FOR ILLINOIS VETERINARIANS

On July 1, 1917, the department of registration and education of Illinois succeeded to the powers and duties vested by law in the state board of veterinary examiners. Hereafter, all examinations of veterinarians will be con-

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ducted by a committee of veterinarians appointed from time to time by the department of registration and education.

The next meeting of this committee for the examination of applicants for registration will be held in Springfield on Friday, December 14. All prospective applicants should write to the Department of Education and Registration at Springfield for the necessary blank applications and instructions.

TENNESSEE ASSOCIATION TO MEET WITH THE SOUTHEASTERN STATES

The annual meeting of the Tennessee Veterinary Medical Association was to have been held at Columbia November 7 and 8, but on account of the meeting of the Southeastern States Veterinary Medical Association at Chattanooga December 27, 28 and 29, it has been decided to hold a joint meeting.

Secretary F. R. Youree, of Lebanon, has written an especially strong plea to all Tennessee veterinarians, asking them to attend and take part in the big meeting of the Southeastern states, the latter part of December.

ANYBODY SEEN DR. MONTGOMERY?

Dr. W. B. Montgomery, Lakewood, N. J., suddenly disappeared from his home, October 12th. Knowledge of his present whereabouts is desired. Address information in care of this office.

DISPENSING PHYSICIANS (AND VETERINARIANS) MUST BE REGISTERED PHARMACISTS IF—

The following very illuminating resolution was adopted at the recent meeting of the N. A. R. D., which requires no comment:

Resolved: That the National Association of Retail Druggists advise and assist the pharmaceutical associations of the several states to have enacted state laws that will enable and oblige the state boards of pharmacy or other properly constituted authorities to inspect the medical substances, preparations, and devices, of whatsoever nature, sold or otherwise disposed of, by any person within the state, for a monetary consideration of its equivalent or in connection with any transaction involving the remuneration of the disposer, or held for the purpose of any such disposal, and to take such action as may be provided by any law requiring a medicine, drug, or curative device to conform to certain standards in substance or in description, against every violator of any such requirement; and be it further

Resolved: That the National Association of Retail Druggists prepare and supply to

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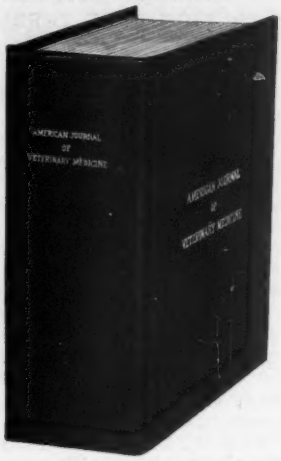

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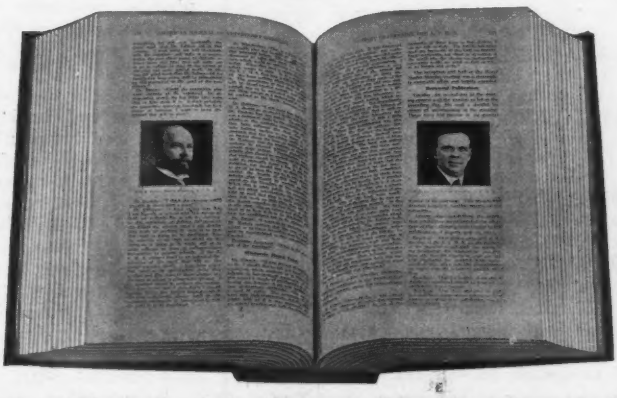

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state pharmaceutical associations a model for such a law.

Resolved: That this association use every power at its command to curtail, or obliterate, the pernicious activities of the medicine peddler and the aggressive dispensing doctor, with the end in view that only duly licensed or registered pharmacists be allowed to compound and dispense medicines.

MISSISSIPPI IN TICK FREE TERRITORY

The federal quarantine against the movement of cattle will be lifted from 65,520 square miles of territory December 1.

This is the largest amount of territory ever liberated at one time since the federal campaign against the cattle tick was started in 1906. To this should be added 5,234 square miles freed in March and September of this year, making 1917 by far the greatest year in the annihilation of the cattle tick.

Nine southern states will benefit by the release order, the largest beneficiary being Mississippi, which will be entirely freed from the quarantine and will open a broad avenue of tick free territory from the northern states to the Gulf.

SOUTHEASTERN STATES MEETING DURING THE HOLIDAYS

The Southeastern States Veterinary Medical Association will hold its second annual meeting in Chattanooga, Tenn., December 27, 28 and 29, headquarters at the Hotel Patten.

Coming as the meeting does, during the holidays and held in a center of great scenic and historic interest, it is expected that there will be a large attendance. Chattanooga, be it remembered, is within easy reach of Look Out Mountain, Chicamauga National Park, Missionary Ridge, Signal Mountain, Orchard Knob and other points made historic during the Civil War.

It is but a short trip to Fort Oglethorpe, where the clinic of the meeting will be held and an opportunity for the visitors to see a base hospital in operation and a training and remount camp.

Among others, the literary program will contain the following papers:

The Education of the Veterinarian From the Farmers' View Point, by Tait Butler.

Anthrax and Its Control, by J. B. Bushong.

Influenza and Its Complications, by R. L. Humphrey, chief veterinarian of the Southern Railway.

Inspection of Live Stock for Interstate Shipment, by M. Jacob.

Some Important Considerations in the

BACTERINS

B. Abortus Vaccine, for the protection of bovines against B. Abortus (Bang).
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Control of Hog Cholera, by Robert Jay, U. S., B. A. I.

Special Therapeutic Indications, by H. Jensen.

Biologics in Practice, by H. K. Wright.

Abortion Disease, by W. L. Williams.

DR. G. A. ROBERTS, Secretary.

Raleigh, N. C.

Report of the Veterinary Director General of Canada, For 1916

By F. Torrance, Ottawa

This is a record of achievement of which the Department of Agriculture of the Dominion may well be proud. Among the matters of particular note we find the following:

There has been a gratifying reduction in the number of horses destroyed for glanders, the number (226) being smaller than for any previous year, and less than one-eighth of the high mark of a decade ago.

The number of cases of dourine (220) likewise shows a decrease of about 40 percent from that of the preceding year. The area quarantined on account of cattle mange was reduced during the year.

A very interesting report is the one detailing the result of an investigation as to the advantages and disadvantages of the intradermal tuberculin test. This test was used on 1,006 animals destined for slaughter and the results were so unsatisfactory, both because of the condemnation of healthy animals and because the failure to condemn diseased animals, that the test was unqualifiedly condemned.

This conclusion is in such marked contrast to that reached from the use of this test on a vastly greater number of animals in the United States as to be of particular note.

In view of the excellent results obtained by Dr. D. F. Luckey of Missouri, and others, in more than one hundred times the number of cattle used in the experiment above referred to, one is forced to the conclusion that a different technic for the test must have been used in the Canadian experiment. It should be repeated here that while the champions of the intradermal tuberculin test maintain that it is superior to the thermic test not only in the results obtained but in a reduction of the amount of work necessary, they admit that more skill is required in its application.,

In this discussion of this test given in the report of the veterinary director general, no mention is made of the technic carried out but from the mention of swellings occurring at the point of injection in non-infected animals, one surmises that the inspection of the cattle for the purpose of picking out the reactors was made too soon after the injec-

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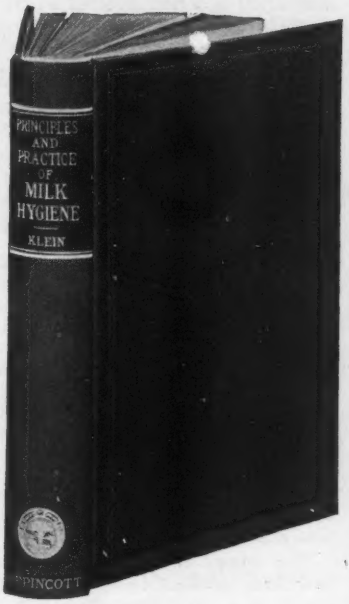
Principles and Practice of Milk Hygiene

By LOUIS A. KLEIN, V. M. D.

Professor of Pharmacology and Veterinary Hygiene in the School of Veterinary Medicine at the University of Pennsylvania, and Dean of the Faculty.



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CONTENTS

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METHODS OF EXAMINING MILK.
COLOSTRUM.
MILK.
BACTERIA IN MILK.
MILK DEFECTS.
DAIRY FARM INSPECTION.
PASTEURIZATION.
APPENDIX.
INDEX.

It presents systematically, in concise form, the facts and principles which are of importance in the practice of milk hygiene and describes how they may be applied in the inspection of dairy farms and in the examination of milk. The material has been obtained from various sources. Jensen's "Milk Hygiene," Savage's "Milk and the Public Health," Conn's "Practical Dairy Bacteriology," Swithinbank and Newman's "Bacteriology of Milk," King's "Ventilation," Van Slyke's "Modern Methods of Testing Milk and Milk Products," Grimmer's "Chemie und Physiologie der Milch," Rievel's "Milchkunde," Wiegmann's "Mykologie der Milch," Ernst's "Milchhygiene für Tierärzte," Sommerfeld's "Handbuch der Milchkunde," and Barthel's "Methoden zur Untersuchung von Milch und Molkereiprodukten" have been freely drawn upon, while articles by numerous research workers which have appeared in the various journals and official reports have furnished many important facts.

The book is intended primarily as a text for students taking a course in milk hygiene, but it will also prove of service to dairy inspectors, milk examiners, public health officials, dairymen, milk distributors, and others interested in the production of wholesome milk.

A Very Important and Long-Awaited Volume on

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Professor of Veterinary Pathology, School of Veterinary Medicine, University of Pennsylvania.

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This book has been written in an endeavor to fill a gap in the American veterinary literature which was keenly felt by the author in teaching post-mortem pathology. It is with the earnest hope that it may help those who do make post-mortem examinations, encourage those who should but do not perform autopsies, and that it may facilitate the inclusion of the subject post-mortem pathology in the curricula of schools of veterinary medicine.

It pretends only to the mechanics of post-mortem examinations, presenting a few instruments and rules for cutting and describing tissues which are indispensable to the operator in adequately exposing the various anatomical parts for that deep study of the relationship of organs and pathological lesions demanded in careful post-mortem examinations.

The illustrations of technical methods in the text were prepared from original photographs of fresh specimens instead of line drawings. Good photographs more forcibly portray to the student mind the reality of the subject, and establish a closer personal association with the actual work. They provide an unexaggerated object for the student to attain to, and an encouraging stimulus to his best efforts.

CONTENTS

GENERAL CONSIDERATIONS.
AUTOPSY ROOM.
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EXTERNAL EXAMINATION.
INTERNAL EXAMINATION OF THE HORSE.
INTERNAL EXAMINATION OF RUMINANTS.
INTERNAL EXAMINATION OF SWINE.
INTERNAL EXAMINATION OF THE DOG AND CAT.
INTERNAL EXAMINATION OF THE MOUSE, GUINEA-PIG, RABBIT, FOWL, AND ELEPHANT.
TECHNIC AND DESCRIPTION OF ORGANS.
POST-MORTEM PROTOCOL AND REPORT.
APPENDIX.
INDEX.

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tion. This would account for occasional condemnation of a non-infected animal and for the failure to detect many diseased animals whose reaction is somewhat delayed. It has been pointed out by Dr. Luckey that the inspection was not to be made earlier than seventy-two hours after the intradermal injection of tuberculin.

That section of the report dealing with hog cholera is gratifying indeed. In Canada it will be remembered that the slaughter and quarantine method prevails for handling outbreaks of hog cholera. In 1915, 34,970 hogs were destroyed because of exposure to cholera, while in 1916 the number dropped to 5,700 and the compensation for the destroyed hogs dropped from $138,000 to $33,000. The experience of many years has shown that the chief cause of cholera in Canada is the feeding of uncooked garbage. During the last year the Department of Agriculture has prohibited the feeding of garbage, either raw or cooked, except by persons licensed by the veterinary director general. In this way it is hoped to provide for the thorough cooking of all garbage before it is fed to hogs.

The report of the biological laboratory, in charge of Dr. Higgins, contains an account of a very interesting test to determine the efficacy of various disinfectants. The phenol coefficient of various common disinfectants was found to be as follows:

Coopers' fluid, 1.9; cresol from .2 to 2.98; crude carbolic acid from .6 to 5.56; creolin from 2.2 to 4.6; formaldehyde, .2; izal, 2.62; pyxol, 10.6 to 13; zenoleum, 2.3.

Report of the Washington State Veterinary Medical Association

This booklet of 72 pages contains the papers, discussions and proceedings of the ninth annual meeting of the Washington Veterinary Medical Association, held at Pullman, June, 1917. It is compiled and edited by Dr. Carl Cozier, secretary, Bellingham, Wash.

Among papers of general interest to practitioners, we may mention Straw Stack Poisoning of Horses, by G. A. Unbewust; Diseases of Sheep, by Dr. E. T. Baker; Common Diseases of Poultry, by Dr. B. T. Sims; The County Agent, by Dr. A. R. Hahner; Fern Staggers, by Dr. A. C. Brown, and Municipal Meat Inspection by Dr. R. A. Button.

The report contains a list of graduate veterinarians licensed to practice in the state of Washington.

Report of the Colorado Veterinary Medical Association.

This report contains the papers and proceedings of the fourteenth annual meeting

Influenza, Distemper, Strangles, Laryngitis, Pharyngitis, Bronchitis, Pneumonia, Coughs, Oedema Glottidis, Infectious Diarrhea, Gastric or Intestinal Flatulence, Canine Distemper

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By B. F. Kaupp, M. S., D. V. S., Pathologist and Poultry Investigator, North Carolina Agricultural Experiment Station and Agricultural and Mechanical College.

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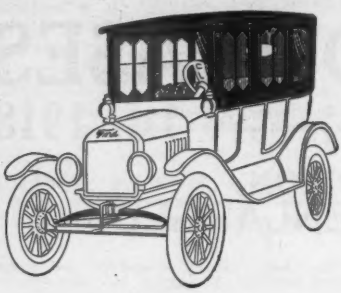

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of the Colorado Veterinary Medical Association at Denver, January, 1917, and the semi-annual meeting at Ft. Collins in June, 1917, compiled and edited by Dr. I. E. Newsom, Ft. Collins, secretary.

Among papers of general interest, we find Necrobacillosis in Pigs, by Dr. J. F. Meinzer; The Whorled Milk Weed by Dr. Geo. H. Glover; Contagious Abortion by Dr. I E. Newsom; A Glimpse at Opportunities by Dr. Chas. G. Lamb, and numerous others.

Live Stock Sanitary Laws of Montana

This pamphlet of 136 pages includes a compilation of all the laws dealing with the quarantine, transportation of live stock, practice of veterinary medicine, together with regulations of the live stock board, the veterinary examining board, and opinions of the attorney general, and related subjects. All veterinarians doing inspection for shipment into the state of Montana should obtain a copy of this pamphlet.

Report of the North Carolina Live Stock and Poultry Associations

This is a creditable booklet of nearly 100 pages in which may be found papers by various leading men in the live stock industry of North Carolina.

Many of these papers are of interest to veterinarians.

Hog Cholera: Prevention and Treatment

By M. Dorset and O. B. Hess
Farmers' Bulletin 834, United States Department of Agriculture.

Hog cholera destroys about 90 per cent of all hogs that die from disease in the United States. The losses have amounted to between 6,000,000 and 7,000,000 hogs in one year, and the money loss probably has averaged more than $30,000,000 a year for the last forty years.

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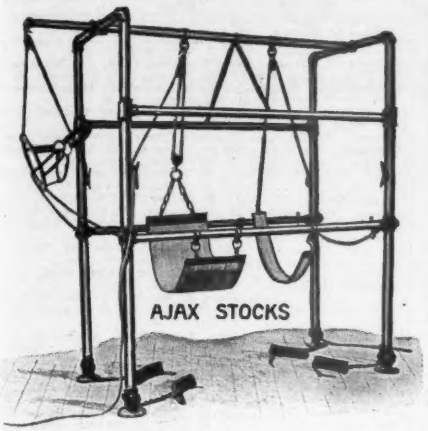
Eradicating Tall Larkspur on Cattle Ranges in the National Forests

By A. E. Aldous
Farmers' Bulletin 826, United States Department of Agriculture.

Poisoning by tall larkspur causes heavy losses of cattle in the National Forests each year. During the last three years, 5,500 head of cattle were lost annually. The most effective way to prevent this loss is to grub out the plants, a method of eradication which gives permanent results; other expedients are likely to be temporary.



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ASSOCIATION MEETINGS

The information given below is up-to-date and has been furnished by the secretaries of the various associations listed. Secretaries are requested to supply us data regarding their associations after each meeting; otherwise, the association will necessarily be dropped from the list. We ask secretaries to kindly co-operate with us in keeping before the members of their associations the date and place of the next meeting.

Name of Association	Date of Meeting	Place of Meeting	Secretary
Alabama Vet. Med. Assn.	.....	.....	C. A. Cary, Auburn, Ala.
Alumni Assn., Col. of Vet. Med., O. S. U.	.....	Columbus, O.	W. R. Hobbs, O. S. U., Columbus, O.
Alumni Assn., N. Y. State Vet. College	.....	New York	P. K. Nichols, Port Richmond, N. Y.
Alumni Assn., U. S. Col. Vet. Surg.	April 1918	Washington, D. C.	Chas. M. Mansfield, 1344 Newton St., Washington, D. C.
American Vet. Med. Assn.	Aug. 20-24, 1918	Philadelphia	L. A. Merillat, 1827 Wabash, Chicago.
Arkansas Vet. Med. Assn.	Jan. 1918	Little Rock, Ark.	R. M. Gow, Little Rock.
British Columbia Vet. Assn.	.....	Penticton, B. C.	Kenneth Chester, New Westminster, B. C.
B. A. I. Vet. Assn. of So. Omaha	4 times a year	So. Omaha, Neb.	J. W. Giffee, c/o B. A. I., So. Omaha
California State Vet. Med. Assn.	.....	.....	F. M. Haves, Davis, Cal.
Central Canada Vet. Assn.	3rd week Jan. 1918	Ottawa, Ont.	A. B. Wickware, Exp. Farm, Ottawa.
Central N. Y. Vet. Med. Assn.	June and Nov.	Syracuse, N. Y.	W. B. Switzer, Oswego, N. Y.
Chicago Vet. Society	2nd Tues. of month	Chicago, Ill.	J. B. Joffray, 1524 S. Albany, Chicago.
Colorado Vet. Med. Assn.	.....	Denver, Colo.	I. E. Newsom, Ft. Collins, Colo.
Conestoga Veterinary Club	2nd Thurs. of month	Lancaster, Pa.	H. W. Barnard, 539 E. King St., Lancaster, Pa.
Connecticut Vet. Med. Assn.	.....	.....	A. T. Gilyard, Waterbury, Conn.
Eastern Iowa Vet. Med. Assn.	.....	.....	Jno. Tillie, Muscatine, Ia.
Genesee County Vet. Med. Assn.	.....	.....	W. J. Houden, Flint, Mich.
Genesee Valley Vet. Med. Assn.	July	Rochester, N. Y.	I. H. Taylor, Henrietta, N. Y.
Georgia State Vet. Assn.	.....	.....	Peter F. Bahnsen, Capitol Bldg., Atlanta.
Hudson Co. Vet. Practitioners' Club	Monthly	Jersey City, N. J.	B. D. Blair, 782 Montgomery St., Jersey City, N. J.
Hudson Valley Vet. Med. Society	.....	.....	Wm. Henry Kelly, Albany, N. Y.
Idaho Assn. of Vet. Graduates	.....	Boise, Idaho	C. V. Williams, Blackfoot, Idaho.
Idaho Vet. Med. Assn.	.....	.....	O. C. Engebretson, Burley, Idaho.
Illinois State Vet. Med. Assn.	Dec. 5, 6, 7	Chicago, Ill.	L. A. Merillat, 1827 Wabash Ave., Chicago
Illmo Vet. Med. Assn.	.....	.....	L. R. McKinley, Freeburg, Ill.
Indiana Vet. Med. Assn.	Jan. 15, 16, 17, 1918	Indianapolis, Ind.	Geo. H. Roberts, Indianapolis, Ind.
Iowa Vet. Med. Assn.	.....	Ames, Iowa	H. B. Treman, Rockwell City, Ia.
Kansas Vet. Med. Assn.	Jan. 2, 3, 1918	Manhattan, Kan.	J. H. Burt, Manhattan, Kan.
Kentucky Vet. Med. Assn.	.....	.....	D. E. Westmorland, Owensboro, Ky.
Keystone Vet. Med. Assn.	2nd Tuesday of month	Philadelphia	L. B. Davis, 857 E. Girard, Philadelphia.
Lake Erie Vet. Med. Assn.	1st Tuesday in Dec.	Norwalk, O.	N. D. Backus, Elyria, O.
Los Angeles Vet. Med. Assn.	3rd Wed. of month	Los Angeles	J. A. Dell, 16th & Pacific, Los Angeles.
Maine Vet. Med. Assn.	.....	Bangor, Me.	M. E. Maddocks, Augusta, Me.
Manitoba Vet. Assn.	.....	Winnipeg, Man.	W. Hilton, 275 James St., Winnipeg.
Massachusetts Vet. Med. Assn.	Monthly	Quincy House, Boston	E. A. Cahill, Boston, Mass.
Michigan State Vet. Med. Assn.	1st Tues. & Wed. after 1st Mon. in February	Lansing, Mich.	W. Austin Ewalt, Mt. Clemens, Mich.
Minnesota State V. M. Assn.	Jan. 9, 10, 11, 1918	Minneapolis, Minn.	G. Ed. Leech, Winona, Minn.
Mississippi State Vet. Med. Assn.	January 8-9, 1918	Meridian, Miss.	E. S. Norton, Greenville, Miss.
Mississippi Valley Vet. Med. Assn.	July 6, 1917	Galesburg, Ill.	W. Lester Hollister, Avon, Ill.
Missouri Valley Vet. Assn.	.....	.....	R. F. Bourne, 1336 E. 15th, Kansas City.
Missouri Vet. Med. Assn.	Last week in July	Neosho, Mo.	C. D. Polse, 1336 E. 15th St., Kansas City
Montana Vet. Med. Assn.	.....	.....	A. D. Knowles, Missoula, Mont.
Montgomery Co. Vet. Med. Assn.	Last Fri. each month	Crawfordsville, Ind.	A. B. Niven, Crawfordsville, Ind.

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Name of Association	Date of Meeting	Place of Meeting	Secretary
Nat'l Assn. B. A. I. Employees		Omaha, Neb.	S. J. Walkley, 185 N. W. Ave., Milwaukee
Nebraska Vet. Med. Assn	2nd Tues. & Wed. in Dec.	Lincoln, Neb.	S. W. Alford, Lincoln, Neb.
New York State Vet. Med. Society			
North Carolina Vet. Med. Assn		Charlotte, N. C.	J. P. Spoon, Burlington, N. C.
North Dakota Vet. Assn			W. J. Mulroony, Havana, N. D.
Northeastern Indiana Vet. Assn		Ft. Wayne, Ind.	R. M. Boyd, Arlila, Ind.
Northwestern Ohio Vet. Med. Assn	Feb. 21	Toledo, O.	Paul E. Wood, Ottawa, Ohio.
Ohio State Vet. Med. Assn	Jan. 10, 11, 1918	O. S. U. Columbus, O.	F. A. Lambert, care O. S. U., Columbus.
Ohio Valley Vet. Med. Assn	July	Oakland City, Ind.	C. S. Henry, Terre Haute, Ind.
Oklahoma State Vet. Med. Assn	Jan. 9, 10, 1918	Oklahoma City	R. C. Smith, Enid, Okla.
Ontario Vet. Assn		Toronto, Canada	H. E. Hurd, 897 Queen St., W., Toronto, Ont.
Oregon Vet. Med. Society	June 1918	Portland	B. T. Simms, Corvallis, Ore.
Pennsylvania State Vet. Med. Assn		Harrisburg, Pa.	E. H. Yunker, 2344 N. 13th, Philadelphia.
Rhode Island Vet. Med. Assn	2nd Tues. Jan.		U. S. Richards, Woonsocket, R. I.
San Joaquin Valley Vet. Med. Assn	2nd Wed. of month	Fresno, Cal.	Jos. M. Arburua, Hanford, Cal.
Schuylkill Valley Vet. Med. Assn	3rd Wed., June & Dec.	Reading, Pa	C. R. Potteiger, Reading, Pa.
South Dakota Vet. Med. Assn	Jan. 15, 16, 1918	Sioux Falls, S. D.	S. W. Allen, Watertown, S. D.
Southeastern States Vet. Med. Assn	Dec. 27, 28, 29, 1917	Chattanooga, Tenn.	G. A. Roberts, West Raleigh, N. C.
Southern Aux. Cal. State Vet. Med. Assn			J. A. Dell, 16th & Pacific, Los Angeles.
S. W. Michigan Vet. Med. Assn			L. A. Minter, Niles, Mich.
Tenn. Vet. Med. Assn	Dec. 27, 28, 29, 1917	Chattanooga	F. R. Youree, Lebanon, Tenn.
Texas Vet. Med. Assn		Ft. Worth, Tex.	E. M. Wiggs, Greenville, Texas.
Tri-County Vet. Med. Assn		Liberty, Ind.	Geo. G. Ferling, Richmond, Ind.
Twin City Vet Med. Society	Once a month	St. Paul	C. C. Palmer, St. Paul, Minn.
U. S. Live Stock Sanitary Assn	Dec 3, 4, 5	Chicago	H. S. Ward, St. Paul, Minn.
Utah Vet. Med. Assn		Logan, Utah	E. P. Coburn, Brighton City, Utah.
Veterinary Assn. of Saskatchewan	Aug. 15, 16, 17, 1918	Regina, Sask.	R. G. Chasmar, Hanley, Sask.
Vet. Med. Assn. of New Jersey		Asbury Park, N. J.	E. L. Loblein, New Brunswick, N. J.
Vet. Med. Assn. of N. Y City		New York City	R. S. MacKellar, 351 W. 11th St., N. Y.
Vet. Med. Assn. of Geo. Washington Univ.	1st Sat. each month	Washington, D. C.	L. L. Criswell, 2115 14th St., N. W., Washington, D. C.
Vet. Med. Society Wash. State College	1st and 2nd Tues. ea. mo.	Pullman, Wash.	Clauge Holden.
Virginia State Vet. Med Assn		Norfolk, Va.	W. G. Chrisman, Blacksburg, Va.
Washington State Vet. Med. Assn	June, 1918	Portland, Ore.	Carl Coster, Bellingham, Wash.
West Virginia Vet. Med. Assn		Parkersburg, W. Va.	E. Layne, Huntington, W. Va.
Western Michigan Vet. Med. Assn		Allegan, Mich.	S. McGuire, Grand Rapids, Mich.
Western N. Y. Vet. Med. Assn	Dec. 13, 1917	Buffalo, N. Y.	F. F. Fehr, 36 Prospect Ave., Buffalo.
Wisconsin Vet. Med. Assn	Jan. 18, 19, 20, 1918	Madison, Wis.	W. A. Wolcott, Madison, Wis.
York Co. Vet. Med. Society	1st Tues. after 1st. Mon. of each month	York, Pa.	E. S. Baugticker, 325 Newberry, York, Pa

Farm Sheep Raising for Beginners

By F. R. Marshall and R. B. Millin

Farmers' Bulletin 840, United States Department of Agriculture,

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Swine Management

By George M. Rommel and F. G. Ashbrook

Farmers' Bulletin 874, United States Department of Agriculture.

Hogs are among the most important animals to raise on the farm for meat or for profit, and no farm is complete unless some are kept to aid in the modern method of farming. Swine multiply more rapidly than other farm animals and make greater gains per hundred pounds of concentrated feed consumed.

Live Stock Classifications at County Fairs

By S. H. Ray

Farmers' Bulletin 822, United States Department of Agriculture.

One of the principal objects of a live stock exhibition is to bring before the stockmen and the public a standard of excellence toward which all may strive in the improvement of domestic animals. The educational value of such an exhibition will depend largely upon two things, namely, the classification of the animals to be exhibited and the judgment of the official who passes upon the merits of the exhibits. The two are absolutely dependent upon each other in presenting the lessons which the exhibition should teach.

It is hoped that this publication will aid very materially in standardizing the classification at county fairs and that it will be of assistance to fair officials and prospective exhibitors.

How to Make Cottage Cheese on the Farm

By K. J. Matheson and F. R. Cammack

Farmers' Bulletin 850, United States Department of Agriculture.

Cottage cheese can be made on the farm or in the home with little labor and expense.

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The House Fly

By L. O. Howard and R. H. Hutchison

Farmers' Bulletin 851, United States Department of Agriculture.

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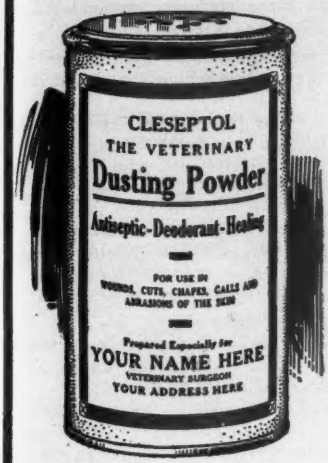

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are actually dangerous to health, because they may carry disease germs to exposed food.

It is therefore important to know where and how they breed, and to apply such knowledge in combating them. This bulletin gives information on this subject. Besides giving directions for ridding the house of flies by the use of screens, fly papers, poisons and fly traps, it lays especial emphasis on the explanation of methods of eliminating breeding places and preventing the breeding of flies.

Trapping Moles and Utilizing Their Skins

By Theo. H. Scheffer

Farmers' Bulletin 832, United States Department of Agriculture.

In this country moles are trapped mainly because they are troublesome, but in some European countries they are trapped extensively, not only to exterminate them, but also for their pelts. Millions of European mole skins have been used by fur manufacturers in this country, and hitherto have furnished the sole supply. Yet the skins of some American moles, especially the common large mole of western Washington and Oregon, are larger and have better texture than those from Europe. This fact has been recognized by some important American fur dealers, and a demand for American mole skins has lately been created.

Utilization of Farm Wastes in Feeding Live Stock

By S. H. Ray

Farmers' Bulletin 873, United States Department of Agriculture.

Live stock men of this country are confronted with a situation unparalleled in history. The unprecendented demand for grains for human consumption makes it imperative that such products be conserved to the utmost and that only those feeds be used for live stock which are not needed for human food.

Game Laws for 1917. A Summary of the Provisions of Federal, State and Provincial Statutes

By George A. Lawyer, W. F. Bancroft and Frank L. Earnshaw

Farmers' Bulletin 910, United States Department of Agriculture.

The object of this bulletin, containing the eighteenth annual summary of the game laws, are to present in convenient form for sportsmen and others the hunting laws and regulations of the federal, state and provincial governments, and to show the general condition and trend of game legislation from year to year.

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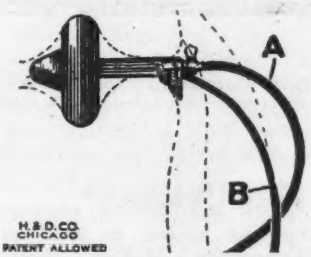

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The Control of Hog Cholera, with a Discussion of the Results of Field Experiments

By Dr. A. D. Melvin.

Farmers' Bulletin 584 United States Department of Agriculture.

This bulletin discusses briefly the nature and prevalence of hog cholera and serum methods of control and in detail, the result of field experiments. In the field experiments undertaken in 1913 in Dallas County, Iowa, Pettis County, Missouri, oMntgomery County, Indiana, and in 1914 extended to Clay County, Iowa, Gage and Johnson Counties, Nebraska, Marshall County, Kansas, and Renville County, Minnesota, the results are doubly encouraging, first because the amount of cholera was reduced to less than 25 per cent of what it was in surrounding counties and second, because the swine population in the counties in which the experiment was conducted was almost doubled. During the same period of years, owing chiefly to the ravages of cholera, the production of swine languished and the swine population in the surrounding counties decreased nearly 40 per cent.

The Chicken Mite: Its Life History and Habits, by H. P. Wood, United States Department of Agriculture Bulletin No. 553.

The Sheep Industry on the Minidoka Reclamation Project, by E. F. Rinehart, United States Department of Agriculture Bulletin No. 573.

Methods of Classifying the Lactic-Acid Bacteria, by Lore A. Rogers and Brooke J. Davis, United States Department of Agriculture, Bureau of Animal Industry Bulletin No. 154.

The Milch Goat in California, by Edwin C. Voorhies, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Bulletin No. 285.

Sheep Feeding, Fattening Western Lambs, Purdue University Agricultural Experiment Station, LaFayette, Ind., Bulletin No. 202, Vol. XX. (Popular Edition.)

Maintenance of Breeding Flocks of Mutton and Wool Sheep, The Pennsylvania State College Agricultural Experiment Station, State College, Pa., Bulletin No. 147.

The Therapeutic Application of Hypertonic Salt-Solution in Conjunction with Leucocytic Extract, by R. A. Archibald and Gertrude Moore, Research Department of the Western Laboratories, Oakland, Cal., 1917.

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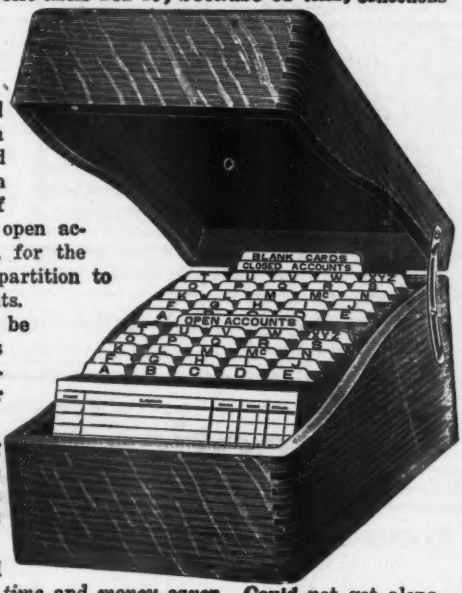

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SURGICAL TREATMENT OF IMPACTION IN A FORD

This subject may be a little out of order for publication in a medical journal, but I know it will do some a world of good. Many of us poor unfortunate veterinarians, through financial distress or on account of bad roads are unable to use an automobile and are, therefore, compelled to use a Ford. On a cold night about 2 a. m., the telephone rings and Farmer Jones has a very sick horse. It's in the middle of winter and the thermometer twenty below zero. We crawl out and get half dressed, and the 'phone rings again. Farmer Jones' voice is heard and he says, "Doc, you needn't come—the horse is dead." Ain't that a grand and glorious feeling?

But sometimes that old horse lives till we get to the garage and meet that old, cold, bound up Ford face to face and the fun begins. We crank ourself black in the face with no results. We use hot water injections to no avail. Off comes the overcoat and we break out in a sweat, swear, kick the old Ford and wish the veterinary profession was where it is warmer. If a man only could have the Kaiser to crank it! O, we would willingly give it to him if we could only know it would crank like that all the time.

Let me tell you something some of you may already know, but some of you do not. How to crank it easy in cold weather. Jack up either hind wheel—say the right one, one to two inches off the ground. Put a block of wood in front of the other hind wheel. Turn on the switch and put the hand brake clear down in high and leave it there. Then go to the front of the car and crank as you always do—easily and fast. The engine will start and you can let it run and shut it off, or you can get in and put your foot on the brake and clutch and pull the hand brake back, stopping the wheel. Try this, boys.

LuVerne, Ia. C. L. WHITTINGTON.

Notes in Regard to Horse Lice, Trichodectes and Haematopinus, by Maurice C. Hall, Parasitologist, Research Department, Parke Davis & Co., Detroit.

Parasites of the Dog in Michigan, by Maurice C. Hall, Parasitologist, Research Department, Parke, Davis & Co., Detroit.

Conglutination Test for the Diagnosis of Glanders, by H. W. Schoening, Journal of Agricultural Research, Washington D. C., Vol. XI, No. 3, October, 1917.

A Milk-Borne Outbreak of Typhoid Fever by Charles F. Bolduan and Charles Krumwiede, Jr., Public Health Reports, Washington D. C., Vol. 32, No. 42, October, 1917.

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Anthrax

Mrs. Emma McCarroll Lindsey of Pass Christian, Miss., has brought suit for $30,000 damages for the death of her husband, which it is alleged was due to anthrax contracted from a shaving brush. A bacteriological examination of shaving brushes in the store from which Mr. Lindsey purchased the one that is supposed to have caused his death, showed a number of them containing anthrax spores.

A serious outbreak of anthrax that recently occurred in Yolo, Napa, Butte and Colusa Counties in California, is reported to be under control. The outbreak resulted in the death of many cattle and one man. A prosecution of one farmer for violating the quarantine placed on his farm by a deputy state veterinarian resulted in a hung jury. The case will be retried.

An outbreak of anthrax was recently reported at DeKalb, Ill., by Dr. F. N. Rowan.

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The *Oakland (Cal.) Tribune*, in an editorial, bitterly castigates those responsible for the "barbaric meanness" of inserting anthrax germs in fresh stab wounds in animals in various localities in California, and refers to the spread of anthrax germs among the cattle of Hawaii by pro-German agents. It also refers to the official report of the German government having sent anthrax germs into Roumania and points out the utter stupidity of such German propaganda, recalling that English aeroplanes at first refused to bomb defenseless cities in retaliation for similar atrocities by Zeppelins and that the allied army for months refused to use poisonous gases as means of attack and for an even longer time declined to use liquid fire in frontal attacks, but that in the face of continued provocation they finally succumbed to temptation in all of these. It also reminds the enemy that allied aeroplanes are able to fly over pretty much all of his territory and that his atrocities if persisted in are likely "to come home to roost."

Dr. F. B. Hadley, Associate Professor of Veterinary Science in the University of Wisconsin, and Miss Jennie E. Potts of Waupaca, Wis. were married at the bride's home, November 4th. Dr. Hadley is well known in veterinary circles throughout the United States. Mrs. Hadley is the daughter of State Senator Potts, of the Waupaca District, and a graduate of the University of Wisconsin.

The *Battle Creek (Mich.) Enquirer*, referring to conditions at Camp Custer, states an official report has been filed in Washington that tells of bad forage conditions found at one of the remount stations.

The loss of several horses and the impairment of the efficiency of others by bad feed has been reported. The report also asks that the veterinary service be made more efficient. It does not blame any officer, but says there is a lack of system.

Dr. Chas. Keene, state veterinarian of California, has warned the farmers of his state against a gang of fake veterinarians who have been conducting a supposed tuberculin test and charging fees for these so-called tests. The state veterinarian's department in California does tuberculin testing free.

Forage Poisoning

Dr. W. E. Neil of Kirksville, Mo., reports the death of about thirty head of cattle from mad itch. The disease was found to exist where cattle and hogs were allowed to run together and the cows eat the cuds dropped

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by hogs after eating green corn stalks. The warm weather causes these cuds to ferment rapidly and when eaten by cattle, brings on a peculiar form of forage poisoning widely known as mad itch.

Dr. F. W. Caldwell and A. C. Ragsdale of the Extension Department of the University of Missouri at Columbia, have arranged for six demonstration meetings on dairy diseases, in the central part of the state. Mr. Ragsdale will discuss economic feeding and care of cows. Dr. Caldwell will discuss the treatment of contagious abortion and use of serum for the prevention of blackleg.

DOSTOR HIGGINS TO LEDERLE

Dr. C. H. Higgens for many years pathologist to the Dominion Department of Agriculture of Canada, has resigned his position to accept a position with the Lederle Antitoxin Laboratories as their Canadian representative, Ottawa, Canada.

Mr. Henry A. Beckwith, eighty years of age, and a prominent citizen of Shullsburg, Wis., died of pneumonia on a train at Waterloo, Iowa, November 7th. Mr. Beckwith was taken ill at St. Paul, and was enroute home accompanied by his wife, two sons, two daughters, the family physician and a trained nurse. He was the father of Dr. A. J. Beckwith, of Shullsburg, Wis., a member of the state board of veterinary examiners.

VETERINARY PRACTITIONERS' SHORT COURSE

A practitioners' short course will be conducted by the University of California, at the university farm at Davis, Cal., December 26, 27, 28 and 29.

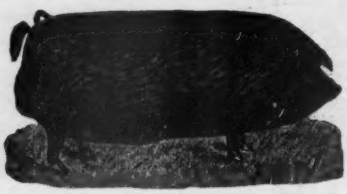
In addition to the veterinary faculty of the university, Drs. John W. Adams, Adolph Eichhorn and K. F. Meyer will assist in the instructions. Clinical and demonstrative features will be arranged. The course is limited to veterinarians. The tuition is free to all, whether they are residents of California or not.

A. V. M. A. TO PHILADELPHIA

The executive board of the American Veterinary Medical Association have decided to hold the next meeting in Philadelphia, commencing on August 19, 1918.

A meeting of the executive board is to be held in Chicago during the first week in December.

U. S. Veterinary License No. 32



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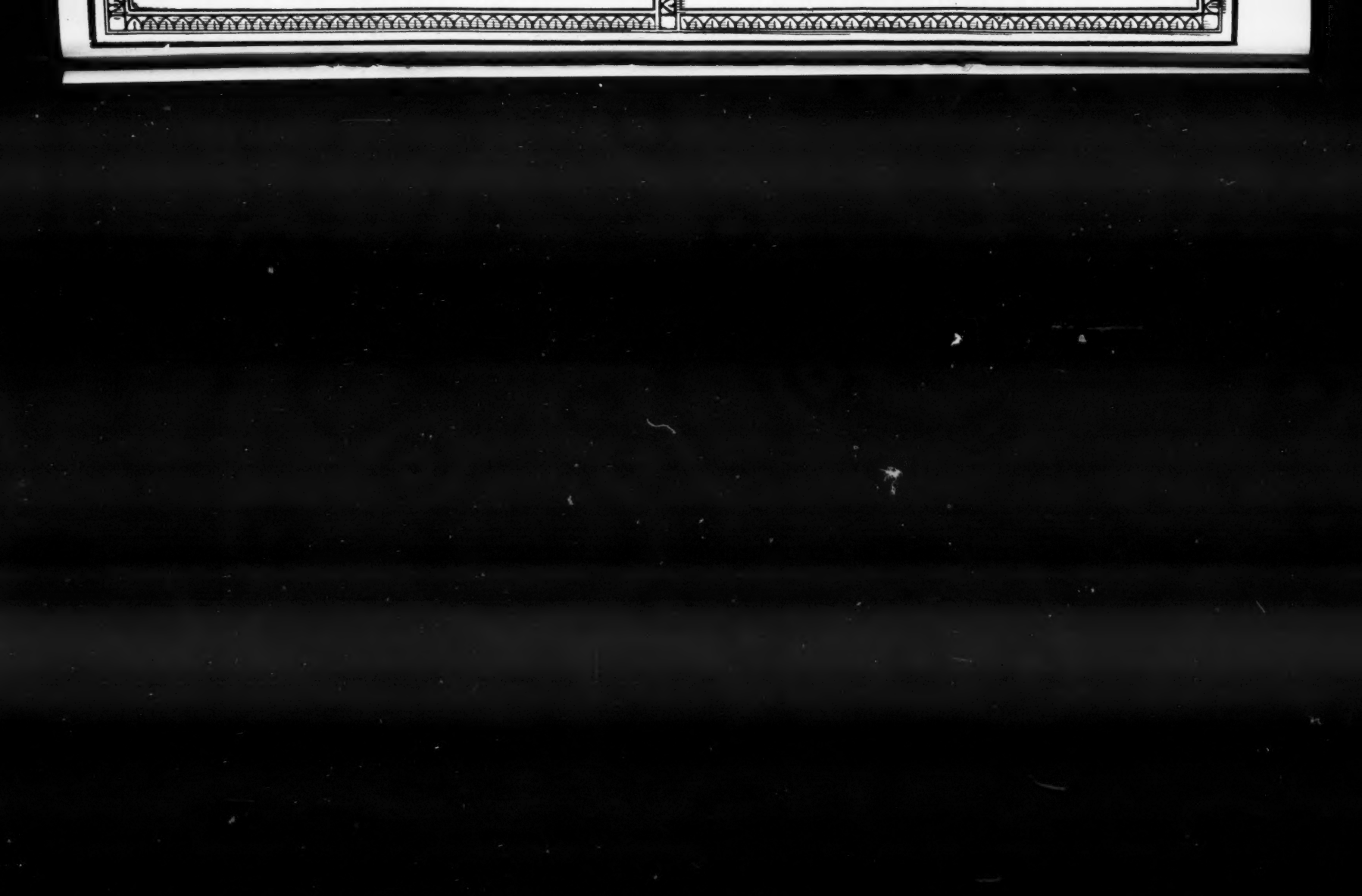

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